

DOUGLAS COUNTY MASTER PLAN
**2016 Douglas County
Transportation Plan**

Prepared for



Approved _____ 2016

Douglas County Board of Commissioners

Prepared by

PARSONS

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EXECUTIVE SUMMARY

Douglas County is responsible for developing and maintaining a long-term regional transportation plan that coordinates implementation of transportation infrastructure and programs. The county prepared a transportation plan in 1993, which was revised in 1996 and again in 2007 as a part of the county's master plan update. In the interests of maintaining a plan that reflects the current conditions and future needs of the community, Douglas County officials contracted with Parsons in 2015 to assist county staff with updating the transportation plan.

Transportation trends indicate that between 2004 and 2011, vehicle miles traveled (VMT) in Douglas County decreased markedly—by 33.6 percent. From 2011 to 2013, VMT increased slightly by eight percent. According to the Federal Highway Administration (FHWA), these changes can be attributed somewhat to the changing economic situation in the United States. The 2008-2009 recession and prolonged recovery, which continues at the time of the writing of this report, contribute to the decline and then subsequent increase in VMT which continues to the current year. Douglas County population growth slowed considerably during the years 2000-2010, increasing by just 5,800 during those ten years. For this reason, county policymakers decided that the transportation plan update would analyze the need for proposed transportation projects based on population projections using a revised set of growth assumptions.

The *2016 Douglas County Transportation Plan* contains the complete list of goals and policies in Chapter 1, Introduction, with each subsequent chapter listing the goals and policies relevant to that chapter. It lists and prioritizes transportation improvement projects needed to maintain acceptable transportation levels of service, as well as identifying projects recommended as safety improvements.

The *2016 Douglas County Transportation Plan* uses 2040 as the horizon year for planning purposes. As Douglas County continues to grow beyond that date, new transportation facilities will need to be planned and implemented to accommodate future growth.

Historic and Projected Growth

According to the U.S. Census Bureau, the 2014 Douglas County population was 47,536, an increase of 15.2 percent over the 2000 population of 41,259. This rate of growth is in the middle range of Nevada counties, substantially less than Clark County (50.4 percent), Lyon County (50.1 percent), Nye County (30.2 percent) and Washoe County (29.6 percent), and slightly more than Storey County (15.1 percent).

Douglas County Community Development issued 4,364 residential building permits from 2000 through 2014. The majority of those permits were issued from 2000 through 2006. The number of permits dropped substantially after 2006. In the past few years the number of permits issued annually has begun to grow. The 2010 census shows an average of 2.39 persons per occupied dwelling unit. For the *2016 Douglas County Transportation Plan*, a 2040



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population of 70,376 has been established for the purposes of travel demand forecasting. The 2040 population projection reflects a 1.39 percent annually compounded growth rate over the State Demographer estimate of 48,478 for 2013.

Douglas County/Carson City Travel Demand Model

Transportation policy makers rely on travel analysis tools to evaluate the impacts of land use development and the need for infrastructure improvements. A travel demand model is one of the key technical analysis tools used for this evaluation. It uses a complex computer program to provide answers to “what if” questions about the effects of proposed development and land use policies. The model predicts travel behavior and travel demand within a specific area, over a particular time period.

A travel demand model uses a four-step process to create a simulation of current and future travel demands.

- Step 1. Trip generation (how many trips will people make?)
- Step 2. Trip distribution (where will people go?)
- Step 3. Mode choice (which methods will people use to travel?)
- Step 4. Trip assignment (what routes will people use?)

To provide a more accurate evaluation of travel patterns, the model encompasses transportation patterns in both Douglas County and Carson City. In addition to reflecting the regional nature of travel in these two counties, the shared model provides an opportunity to assist policy makers with coordinating proposed land use and transportation improvements.

Comparing the model results with actual traffic counts on the roadways indicates that the model was operating very accurately. This “model validation” took place using traffic counts at 69 locations in Douglas County and 103 locations in Carson City. The counts showed an overall total deviation between the travel model and the actual traffic counts of about three to eight percent (AM/PM, off peak and daily), which is within allowable tolerances for planning purposes as described in Appendix A, Douglas County/Carson City Travel Demand Model report.

In addition to validating the model for the base year 2015, Parsons ran the traffic model for the years 2025 and 2040 to determine the transportation system needs in the future. Based on the model results, completing the lists of proposed projects in Chapter 4 will allow Douglas County to maintain an acceptable traffic level of service (LOS) C at all of the critical locations in the county for each of those planning years.

Streets and Highways Element

Chapter 4, the Streets and Highways section of the *2016 Douglas County Transportation Plan* discusses the existing and proposed future transportation network. This section explains the

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methods used for quantifying the transportation network, such as traffic counts on Douglas County streets and highways, classification of streets into arterials, collectors and roadways; and methods for determining the traffic level of service. The section also discusses the major roadway issues in Douglas County, along with specific policies to maintain and improve the transportation network. Finally, this section includes two lists of capacity-improving projects; one for construction between 2016 and 2025, and another for construction between 2026 and 2040. Figure ES.1 provides a map of the Douglas County roadway network indicating the functional classification of the roads.

A significant transportation issue in Douglas County is the concern about traffic safety and capacity along the U.S. 395 corridor through the towns of Gardnerville and Minden. U.S. 395 is the primary corridor through Carson Valley, with a limited number of parallel roads that could absorb any through traffic. In addition, U.S. 395 transitions into historic Main Street through the towns of Gardnerville and Minden. The County and the towns all want a more pedestrian-friendly downtown.

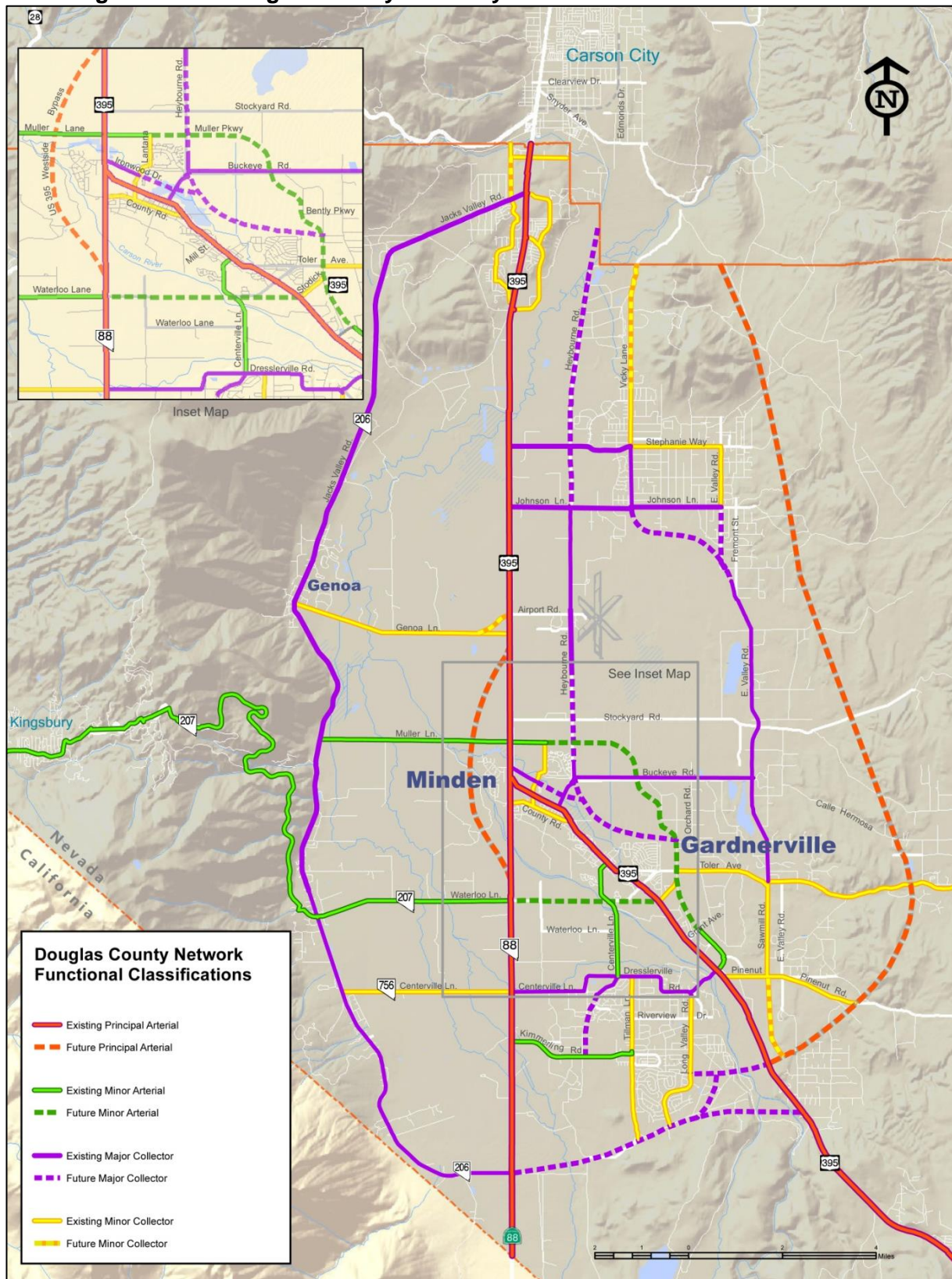
Douglas County has grown slowly over the past 10 years. Although there are currently failures in the Level of Service on U.S. 395 between Minden and Carson City (LOS lower than level D), the existing County-maintained transportation infrastructure has been able to adequately cope with the effects of this growth, maintaining traffic flow with LOS C or better. The additional trips created by new development in both Douglas County and Carson City will add to existing traffic volumes, causing some additional roadway segments to fall below acceptable Levels of Service unless new transportation projects are constructed.

Public Transportation Element

Public transportation is an important part of the overall transportation system, providing mobility to residents who do not have access to private vehicle usage, such as low income persons, the elderly, and persons with disabilities. In addition to providing mobility within Douglas County, public transit allows residents to access regional employment, education and health care services located in the Carson City and Reno/Sparks area. Public transit also has the potential to reduce roadway congestion by reducing the number of vehicles on the road.

Douglas County operates the Douglas Area Rural Transit (DART) Dial-A-Ride service, which carries passengers between the southernmost and northernmost points of the county along the U.S. 395 corridor. It also operates DART Express, a fixed route with a fixed schedule serving the Minden-Gardnerville and Gardnerville Ranchos areas. Douglas County provides transit service in the Lake Tahoe area under a private contract. The BlueGo Bus Service operates along U.S. 50 from Zephyr Cove to Stateline and along the Kingsbury Grade. The Regional Transportation Commission of Washoe County funds and operates an intercity bus service between north Douglas County and the Meadowood Mall, the Reno/Tahoe Airport and downtown Reno.

Figure ES.1: Douglas County Roadway Network Functional Classifications



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As Douglas County continues to focus growth in the Minden/Gardnerville area and along U.S. 395, residents will expect and need a more active transit service in this corridor. The estimated increase in population to 70,376 by 2040 will likely require the development of more frequent fixed route service and demand responsive service covering a wider geographical area. Increased tourist and employment activity in the Lake Tahoe and Carson Valley areas will also provide opportunities for increased use of public transportation in Douglas County.

This plan recommends that Douglas County prepare a short-range transit plan to determine the costs, benefits and logistics of improving local transit services. The proposed transit plan should include evaluation of the existing and future transit projects identified in the County's 5-Year Transportation Plan, and should consider expanded transit service hours, area and frequency of service, and compliance with the Americans with Disabilities Act.

Bicycle/Pedestrian/Trails Element

The *2003 Douglas County Bicycle/Pedestrian/Trails Plan* and the *2014 Douglas County Bicycle Plan* are separate documents that are incorporated by reference in their entirety into the *2016 Douglas County Transportation Plan*.

Aviation Element

The *2008 Minden–Tahoe Airport Plan* is a separate document, which is incorporated by reference in its entirety into the *2016 Douglas County Transportation Plan*.

Financial Element

The Financial Element lists the financial policies approved in the Transportation Element (Chapter 5) of the 2011 Master Plan. The discussion of funding options has been removed from this 2016 update to the Douglas County Transportation Plan.

Lake Tahoe Element

The *2007 Douglas County Transportation Plan* did not address the Lake Tahoe area, nor does this updated plan evaluate the need for projects within the Lake Tahoe Basin. Nevertheless, to provide for continuity with the Transportation Element (Chapter 5) of the 2011 Master Plan, and to provide a complete list of the Transportation policies in this document, the Lake Tahoe Element has been added to this 2016 plan which lists the policies and actions from the 2011 Master Plan relative to the Tahoe area. This element also references the planning agencies and planning documents for the area.

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Chapter 1 INTRODUCTION

1.1 Overview

Douglas County is located in northern Nevada just south of the state capital, Carson City, and about 35 miles south of the state's third largest city, Reno. Containing 735 square miles of valley floor, rolling hills and steep mountains, Douglas County is less than 130 miles from the Sacramento metropolitan area and less than 220 miles from the San Francisco/San Jose metropolitan area. The rural character, excellent climate and beautiful scenery make Douglas County a desirable place to live.

The county has grown from a small, predominantly agricultural community in the 1960's to an urbanized population center with an estimated 48,208 residents in 2014. Douglas County population grew most rapidly during the 1970's, experiencing steady growth until 2000. From 2000 to 2010, population growth in the county slowed significantly, increasing by just 5,800 during those ten years. The U.S. Census Bureau's estimated 2014 population figures indicate that Nevada is the second-fastest growing state in the nation, with a total population of 2.8 million people and a growth rate of 1.71 percent between July 2013 and July 2014. Based on an increase of 1.39 percent per year (the historic growth rate identified in the 2011 Master Plan, compounded annually, the 2040 population of Douglas County will be approximately 70,400 persons.

Transportation trends reported by the Nevada Department of Transportation indicate that between 2004 and 2011, vehicle miles traveled (VMT) in Douglas County decreased markedly—by 33.6 percent. From 2011 to 2013, VMT increased slightly by eight percent. According to the Federal Highway Administration (FHWA), these changes can be attributed somewhat to the changing economic situation in the United States. The 2008–2009 recession and prolonged recovery, which continues at the time of the writing of this report, contribute to the decline and then subsequent increase in VMT which continues to the current year.

For this reason, county policymakers decided that the transportation plan update would analyze the need for proposed transportation projects based on revised population projections using an updated travel demand model.

The *2016 Douglas County Transportation Plan* contains the complete list of goals and policies in Chapter 1, Introduction, with each subsequent chapter listing the goals and policies relevant to that chapter.

1.2 Updating the 2007 Transportation Plan

Douglas County is responsible for developing and maintaining a long-term regional transportation plan that coordinates implementation of transportation infrastructure and

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programs. Douglas County staff prepared a transportation plan in 1993, which was revised in 1996 as a part of the county's master plan update. In 2005, county officials contracted with Parsons to update the transportation plan for 2007. Parsons has again been designated to update the Transportation Plan section of the Douglas County Master Plan for the year 2016.

The *2016 Douglas County Transportation Plan* update began in 2015 with the collection of traffic data on every arterial and collector in the Carson Valley. It continued with a roadway capacity analysis to determine the existing traffic level of service (LOS) on major arterial streets in Douglas County during morning and evening peak periods. Using U.S. census data, Douglas County tax parcel information, state provided employment records and land use information, Parsons updated the traffic demand model they developed in 2007 to simulate travel between traffic analysis zones. Using projections about future growth levels from the county's land use plans and information on approved projects, the travel model shows where people travel now and predicts where they will travel in the future.

Knowing where and when people will travel allows transportation planners to determine which transportation facility improvements are required to keep traffic flowing at an acceptable level of service, which is LOS C for Douglas County maintained roads, and LOS D for Nevada Department of Transportation roads. A plan can then be developed which contains lists of specific projects with timeframes for completion to maintain acceptable levels of service. By linking transportation improvements to areas of increasing population, Douglas County residents will continue to enjoy relatively free flowing traffic conditions.

The most recent version of the traffic model is based on land use decisions made by Douglas County officials and assumptions made by Douglas County staff. As land use decisions change and different projects are completed on different time schedules, county staff will be able to monitor population, employment and travel data. Future transportation plan updates will adjust the traffic model to reflect these changes. The travel forecast model also takes into account the existing and future traffic patterns of areas outside Douglas County. By examining the land use and traffic patterns of the adjacent governmental entities including Carson City, Washoe County and Lyon County, the Douglas County model more accurately reflects the current and future traffic conditions.

1.3 Goals and Policies of the Transportation Plan

The goals and policies represent the guiding principles of the transportation plan for Douglas County in the Carson Valley and Topaz planning areas. Goals, policies and objectives for the Lake Tahoe planning area are contained in the *Lake Tahoe Regional Plan*, prepared by the Tahoe Regional Planning Agency and approved in February 2013.

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1.3.1 GOALS

The following are the overarching goals of the Transportation Plan:

- GOAL 1: Provide and maintain an integrated transportation system for the safe, efficient movement of people and goods throughout Douglas County.
- GOAL 2: Provide appropriate transportation facilities to ensure a high quality-of-life for Douglas County residents.

1.3.2 POLICIES

The following policies form the basis for implementation of the goals identified above. These policies are also identified in the chapters that follow.

Chapter 2: Historic and Projected Growth

- 2.3.1 Evaluate the impacts of current and planned development in Douglas County.
- 2.3.2 Coordinate transportation planning and land use development.

Chapter 3: Travel Demand Model

- 3.4.1 Update the travel demand model on a regular basis, at least every ten years.
- 3.4.2 Maintain accurate data on population, employment and average daily traffic to facilitate travel model update.

Chapter 4: Streets and Highways Element

- 4.2.1 Identify high accident locations and take appropriate actions to ensure continued public health and safety.
- 4.2.2 Provide appropriate traffic control devices on new and existing transportation facilities.
- 4.2.3 Protect public safety by removing snow and other hazards from roadways.
- 4.2.4 Post appropriate speed limits based on current speed limit studies.
- 4.2.5 Remove litter, trash and debris from the roadside and the right-of-way to keep roadways within Douglas County aesthetically pleasant.
- 4.2.6 Implement near-term traffic safety and traffic operations improvements from 2016 to 2020.
- 4.2.7 Implement mid-term road improvements to provide acceptable traffic operations from 2016 to 2025.
- 4.2.8 Implement long-term road improvements to provide capacity and mobility from 2025 to 2040.

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- 4.2.9 Maintain a traffic level of service “D” on all NDOT roads within Douglas County, consistent with NDOT standards.
- 4.2.10 Develop a “pedestrian-friendly” U.S. 395/Main Street corridor through Minden and Gardnerville.
- 4.2.11 Support NDOT projects that maintain traffic flow (high speed and capacity) on U.S. 395 between Minden and Carson City, as identified in the *U.S. 395 Southern Sierra Corridor Study (2007)*.
- 4.2.12 Support possible bypass facilities to keep traffic moving through Minden and Gardnerville.
- 4.2.13 Develop a truck routes plan to keep excessive through traffic out of neighborhoods.
- 4.2.14 Resolve/prevent neighborhood traffic issues by providing adequate through traffic facilities on major collectors and arterials.
- 4.2.15 Provide traffic transitional facilities (such as traffic circles/roundabouts) in the Minden/Gardnerville area.
- 4.2.16 Maintain a current map of proposed Douglas County transportation improvement projects.
- 4.2.17 Maintain current design standards for Douglas County roadway classifications as identified in the *Douglas County Design Criteria and Improvements Standard Manual*.
- 4.2.18 Maintain a level of service “C” or better on all Douglas County streets and roadways.
- 4.2.19 Provide transitional facilities between higher and lower classes of roadway functional types.

Chapter 5: Public Transportation Element

- 5.5.1 Provide general public transit service to Douglas County residents and visitors.
- 5.5.2 Provide transit services to the elderly and persons with disabilities, as required by the Americans with Disabilities Act (ADA).
- 5.5.3 Provide regional public transit, connecting Douglas County residents and visitors with Carson City, Washoe County and Alpine County (California).
- 5.5.4 Promote use of local and regional public transit serving Douglas County residents and visitors.

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- 5.5.5 Develop public transit goals and objectives to measure and evaluate transit system performance.
- 5.5.6 Annually review performance measures and indicators for existing transit services and adjust services accordingly.
- 5.5.7 Prepare a short range transit plan, including a five-year transit project list, which identifies transit needs, and potential service improvements along with a financial plan.
- 5.5.8 Establish and preserve a transportation corridor in the vicinity of the former Virginia & Truckee Railroad right-of-way between Minden and the Carson City line, parallel to Heybourne Road.
- 5.5.9 Evaluate the feasibility of providing rubber-tire transit service to initially serve major travel destinations as development occurs along the Heybourne Road corridor. Identify potential private and public funding sources to establish and maintain service.

Chapter 6: Bicycle/Pedestrian/Trail Element

- 6.1.1 Maintain and implement the adopted Douglas County Comprehensive Trails Plan to provide opportunity for non-motorized transportation within the county that meets both recreational and commuter needs.
- 6.1.2 Ensure development and maintenance of multi-purpose (hiking, equestrian, bikeway and off-road bicycle) trail systems throughout Douglas County, connecting with public lands and recreational facilities of local and regional interest.
- 6.1.3 Maintain and implement the adopted Douglas County Bicycle Plan.

Chapter 7: Airport Element

- 7.1.1 Provide for safe continuation and expansion of the Minden–Tahoe Airport.

Chapter 8: Financial Element

- 8.1.1 Coordinate with the NDOT to implement capital and operational improvements on state facilities in a timely manner.
- 8.1.2 Develop funding mechanisms to implement system-wide capacity and operational system improvements to the street and highway network.
- 8.1.3 Develop funding mechanisms to maintain the existing street and highway network.
- 8.1.4 Develop funding mechanisms to implement public transportation system improvements.

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- 8.1.5 Develop funding mechanisms to implement improvements to the bicycle/pedestrian/trails system.
- 8.1.6 Develop funding mechanisms to implement improvements at the Minden–Tahoe Airport.
- 8.1.7 Explore the development and implementation of a traffic impact fee program to fund regional capacity improvements on the street and highway network.
- 8.1.8 Develop and maintain a coordinated transportation plan of proposed transportation facility improvements in collaboration with adjacent jurisdictions.
- 8.1.9 Construct and maintain necessary street and road facilities in rural and urban settings to maintain a high quality-of-life in Douglas County. (See Complete Streets Policy dated January 19, 2016.)

Chapter 9: Lake Tahoe Element

LT Policy 1: Participate and support the planning, design and implementation of transportation projects and transit improvements at Lake Tahoe consistent with the Tahoe Revitalization initiative of the County Economic Vitality Plan and other needs identified through the annual update of the County 5-Year Transportation Plan, County Transportation Plan, and plans of the TRPA, TMPO and TTD.

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Chapter 2 HISTORIC AND PROJECTED GROWTH

The *2016 Douglas County Transportation Plan* incorporates information about current land use development and the existing transportation network along with projections about future development and improvements. To develop this information, Parsons collected data from the U.S. Census Bureau, the Nevada State Demographer, and the Nevada Department of Employment, Training and Rehabilitation (DETR). The plan uses 2040 as the horizon year for population forecasts and transportation project development.

2.1 Residential Capacity

According to the U.S. Census Bureau, the 2010 Douglas County population was 46,997, an increase of 13.9 percent over the 2000 population of 41,259. This rate of growth is in the middle range of Nevada counties, substantially less than Lyon County (50.7 percent), Clark County (41.8 percent), and Nye County (35.3 percent); and more than Elko County (7.8 percent) and Carson City (5.4 percent). Table 2.1 provides the comparative population figures for all Nevada counties from 2000 to 2010, with Nevada State Demographer estimates for the year 2014.

Table 2.1: Comparative Population Figures

STATE/COUNTY	2000 POPULATION*	2010 POPULATION*	2014 POPULATION**	PERCENT INCREASE (2000–2010)†
State of Nevada	1,998,257	2,700,551	2,518,869	35.15%
Carson City	52,457	55,274	54,522	5.37%
Churchill County	23,982	24,877	23,989	3.73%
Clark County	1,375,765	1,951,269	2,069,681	41.83%
Douglas County	41,259	46,997	47,536	13.91%
Elko County	45,291	48,818	52,766	7.79%
Esmeralda County	971	783	822	–19.36%
Eureka County	1,651	1,987	2,018	20.35%
Humboldt County	16,106	16,528	17,279	2.62%
Lander County	5,794	5,775	6,009	–0.33%
Lincoln County	4,165	5,345	5,184	28.33%
Lyon County	34,501	51,980	51,789	50.66%
Mineral County	5,071	4,772	4,500	–5.90%
Nye County	32,485	43,946	42,282	35.28%
Pershing County	6,693	6,753	6,698	0.90%
Storey County	3,399	4,010	3,912	17.98%
Washoe County	339,486	421,407	440,078	24.13%
White Pine County	9,181	10,030	10,034	9.25%

Sources: * U.S. Census Bureau—April 1, of 2000 and 2010, respectively

** Nevada State Demographer estimates—July 1, 2014

† U.S. Census Bureau figures only

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As indicated above, the U.S. Census Bureau reported that the growth rate from 2000 to 2010 was 13.9 percent. This historic growth rate was also noted in the 2011 Douglas County Master Plan, Volume II, Chapter 2, Population. In 2013, the State Demographer's Office projected that Douglas County's population would grow at a rate of only 0.1 percent. Both estimates are below the 2.0 percent growth rate projected in the *2007 Douglas County Master Plan*.

During the 15-year period from 2000 to 2014, the County issued 4,364 single family residential building permits, 67 multi-family residential permits (for construction of 444 dwelling units), 12 duplex permits (24 dwelling units), and 176 mobile home permits. In total, 4,619 building permits were issued that resulted in the construction of 5,017 dwelling units, an average of 334 dwelling units per year during that time period. (Refer to Table 2.2.) The 2010 U.S. Census shows an average of 2.39 persons per occupied dwelling unit. Figure 2.1 summarizes the locations of existing housing in the Carson Valley in 2015, while Figure 2.2 shows the split between occupied and non-occupied housing in the Carson Valley.

During the 10-year period from 2005 to 2014, overall employment within the County declined by approximately 18 percent. Of the ten industries identified in Table 2.3 *Employment by Industry*, only three had increases in employment during that time period. Those were professional and business services, education and health services, and other services. The local unemployment rate at the end of 2014 was 7.0 percent of the workforce. Figure 2.3 shows the employment locations in the Carson Valley.

**Table 2.2: Annual Building Permits Issued, Dwelling Units Constructed—
2000 to 2014**

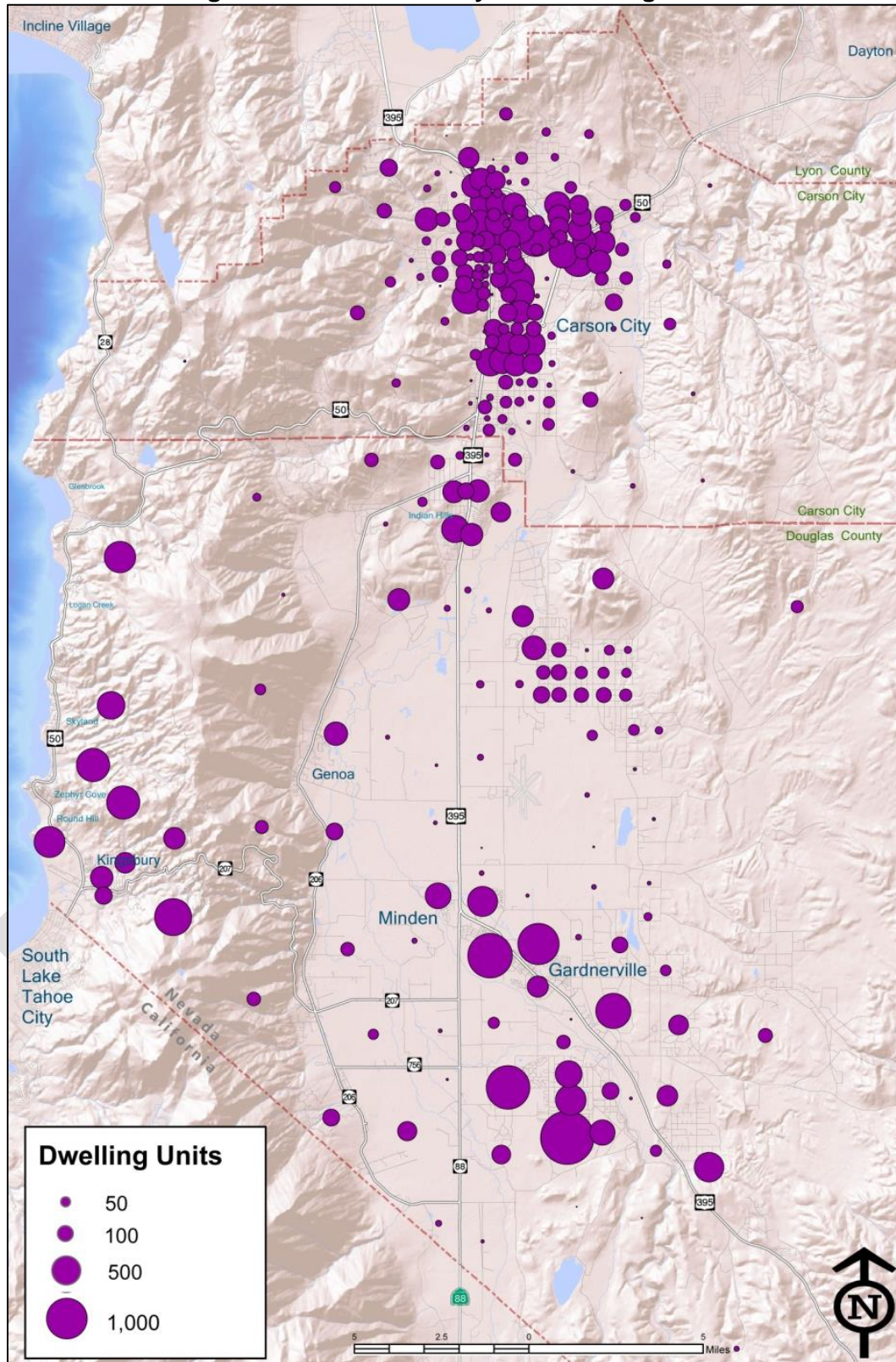
YEAR	SINGLE FAMILY RESIDENTIAL	MULTI-FAMILY RESIDENTIAL Permits (dwelling units)	DUPLEX PERMITS Permits (dwelling units)	MOBILE	TOTAL ISSUED Permits (dwelling units)	DWELLING UNITS ALLOWED BY GROWTH ORDINANCE*
2000	542	4 (64)	0 (0)	29	575 (635)	N/A
2001	560	1 (9)	4 (8)	40	605 (617)	N/A
2002	672	0 (0)	2 (4)	37	711 (713)	N/A
2003	517	24 (104)	2 (4)	27	570 (652)	N/A
2004	505	10 (50)	2 (4)	19	536 (578)	N/A
2005	537	16 (74)	1 (2)	11	565 (624)	N/A
2006	418	0 (0)	1 (2)	4	423 (424)	N/A
2007	145	5 (77)	0 (0)	2	152 (224)	317
2008	48	3 (20)	0 (0)	1	52 (69)	323
2009	43	0 (0)	0 (0)	3	46 (46)	330
2010	35	2 (21)	0 (0)	1	38 (57)	336
2011	35	0 (0)	0 (0)	1	36 (36)	343
2012	49	0 (0)	0 (0)	0	49 (49)	350
2013	107	2 (34)	0 (0)	1	110 (142)	357
2014	151	0 (0)	0 (0)	0	151 (151)	364
Total	4,364	67 (444)	12 (24)	176	4,619 (5,017)	N/A

Source: Douglas County Building Division (amounts figured by calendar year)

Note: Average number of dwelling units constructed each year between 2000 and 2014 is 334.

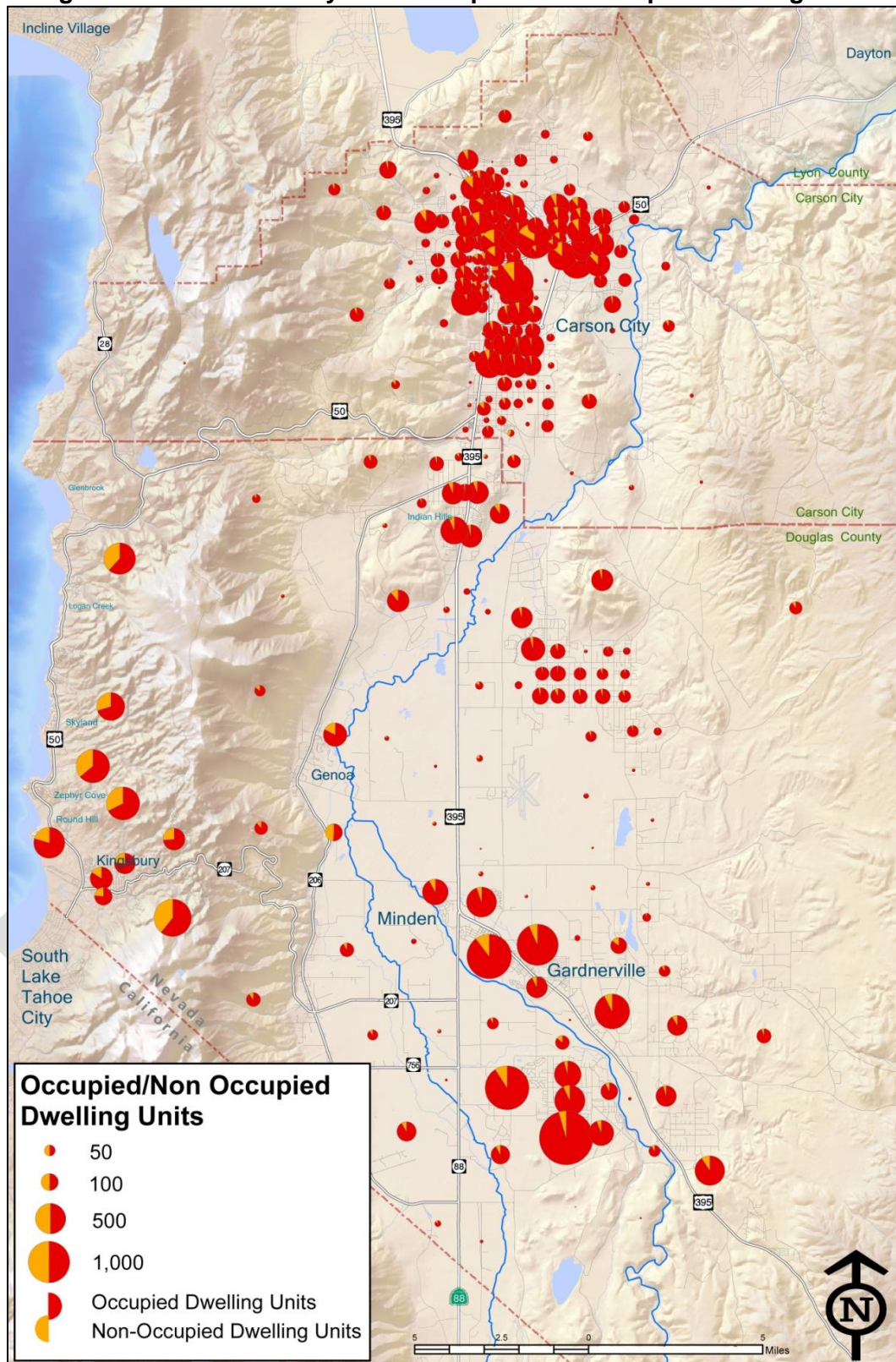
* The Growth Ordinance refers to Douglas County Title 20, Chapter 20.560

Figure 2.1: Carson Valley 2015 Housing Units



Source: 2010 U.S. Census data, City Building Permits

Figure 2.2: Carson Valley 2015 Occupied/Non-Occupied Housing Units



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Table 2.3: Employment by Industry

INDUSTRY	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Mining	185	175	161	149	137	138	134	137	135	132
Construction	2,038	2,092	1,903	1,423	1,015	775	768	752	808	991
Manufacturing	1,727	1,788	1,922	2,029	1,835	1,673	1,694	1,786	1,652	1,677
Trade, Transportation and Utilities	2,754	2,808	2,788	2,642	2,423	2,362	2,335	2,401	2,693	2,683
Information	206	231	204	169	142	135	131	125	127	139
Finance, Insurance and Real Estate	847	791	824	797	761	718	760	752	725	694
Professional and Business Services	1,533	1,688	1,672	1,636	1,480	1,501	1,499	1,453	1,593	1,596
Education and Health Services	1,019	1,120	1,165	1,216	1,249	1,246	1,296	1,352	1,416	1,444
Leisure and Hospitality	8,831	8,520	8,231	7,691	6,456	5,997	6,087	5,904	6,006	5,983
Other Services	364	369	354	369	342	342	351	365	400	400
Government	2,263	2,276	2,292	2,317	2,287	4,100*	2,204	2,158	2,208	2,215
Total	21,767	21,858	21,516	20,438	18,127	18,987	17,259	17,185	17,763	17,954

Source: State of Nevada Department of Employment, Training and Rehabilitation, 2016.

*Spike in government employment likely due to decadal hiring of temporary census workers.

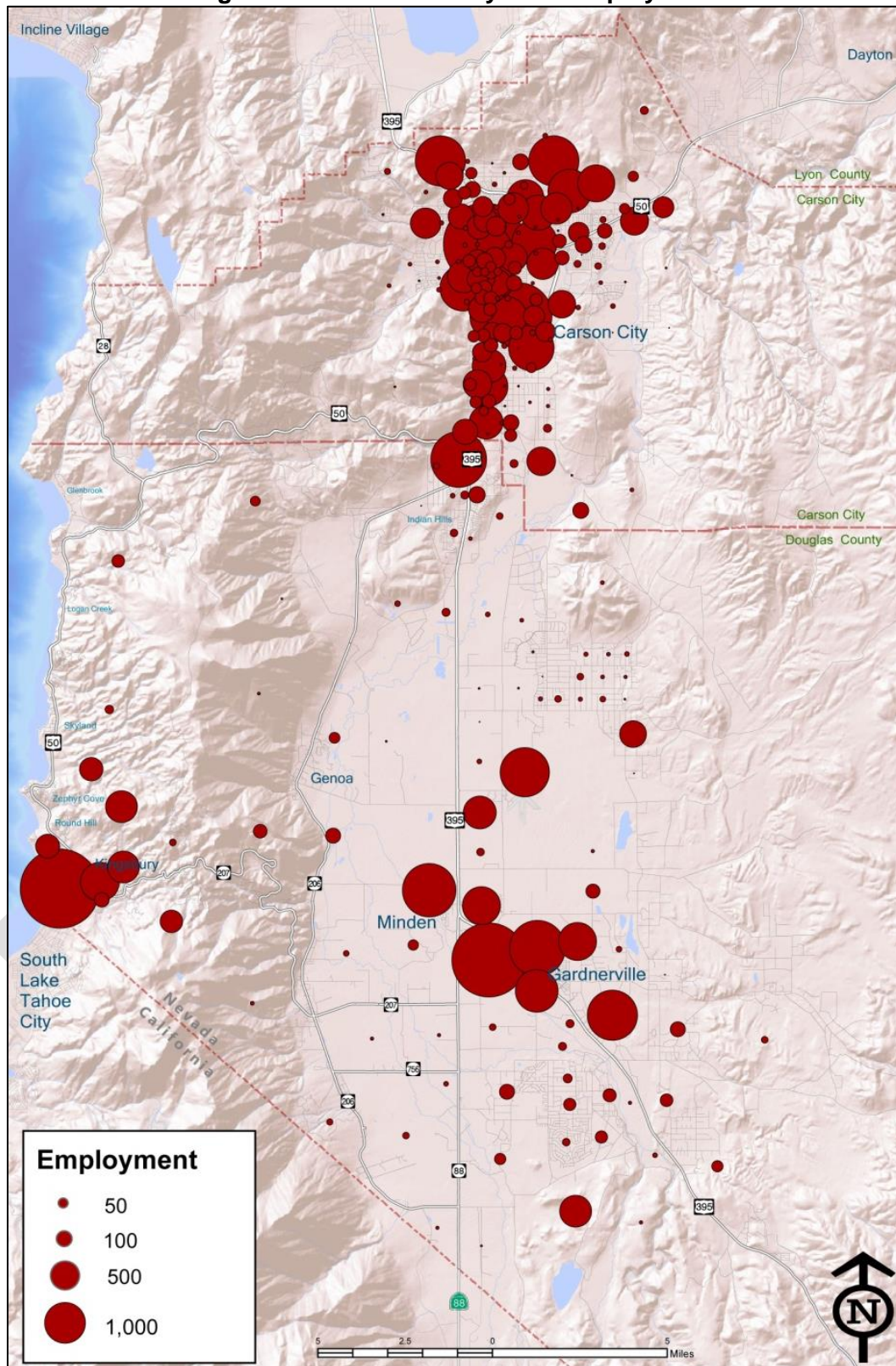
2.2 Projected Growth

The United States Census Bureau (2000), projected that the rate of growth for the state of Nevada would be higher than any other state in the U.S. between 2000 and 2030. The Bureau projected that the state would gain 2,283,845 people by 2030, reaching a population of 4,282,102. This represents an increase of 114 percent during this 30-year period. The population of Nevada was 2,700,551 in 2010. The 2010 U.S. Census does not provide a projection for the year 2040. The process of selecting a population growth rate began by considering four potential growth rates. Those growth rates were:

- Very Slow Growth = 0.1 percent (from the State Demographer's Office, 2013)
- Slow Growth = 1.0 percent (established by Douglas County)
- Historic Growth = 1.39 percent (2010 U.S. Census data and 2011 Master Plan)
- Maximum Growth = 2.0 percent (Douglas County Title 20, Chapter 20.560).

The Nevada State Demographer's Office, in a report dated October 2013, established the 2013 Douglas County population as 48,478. Using this population as the starting point and the above growth rates, Figure 2.4 shows population projections for Douglas County up to 2040. The impacts of these four growth rates on the transportation network were then modeled using the projected 2040 populations and the existing roadway network. The model results were then reviewed with Douglas County Community Development staff, and the Historic Growth Rate of 1.39 percent was established as the rate to be used for all subsequent modeling.

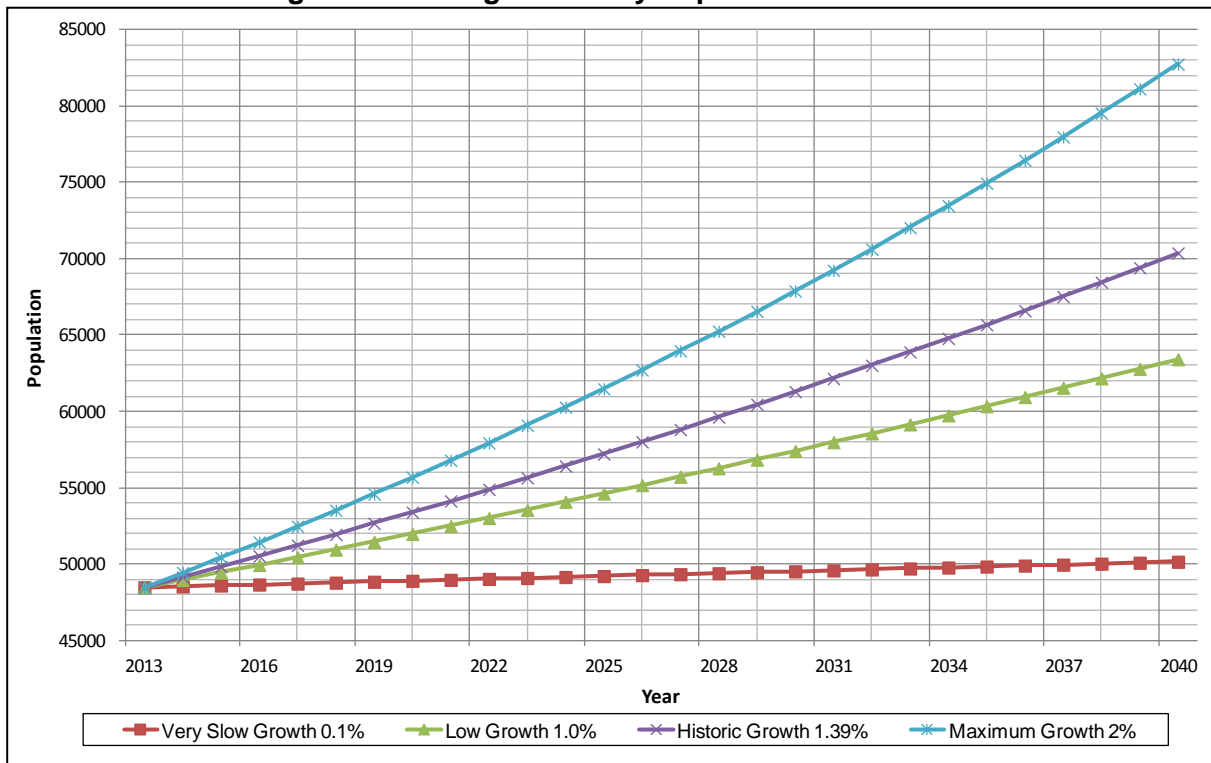
Figure 2.3: Carson Valley 2015 Employment



Source: 2014 Nevada Department of Employment, Training and Rehabilitation

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Figure 2.4: Douglas County Population Forecasts



Source of the 2013 population of 48,478 is the Nevada State Demographer's report *Nevada County Population Projections 2014–2033*, dated October 1, 2014

Use of the Historic Growth Rate of 1.39 percent has a number of benefits compared to the previously used 2.0 percent growth rate:

- Based on past growth, it should approximate future growth more closely than the 2.0 percent growth rate used in 2007 Transportation Plan.
- It appears to be conservative in that it is higher than the rate experienced since 2010.
- For the 2040 scenario, it generates an estimated population of 70,376. This is slightly higher than the buildout population (66,803) identified in the 2011 Douglas County Master Plan Population and Housing–Technical Report based on maximum density associated with unimproved acreage. Accordingly, it anticipates that Master Plan amendments might be approved that would increase densities.

The 2040 population estimate of 70,376 is considerably lower than the estimate of 83,689 reflected in the 2007 Transportation Plan for the planning horizon year 2030. As a result, this 2016 Transportation Plan identifies fewer capacity improvement projects needed to maintain level of service standards than the 2007 Plan.

Douglas County voters approved the Sustainable Growth Initiative in November 2002, limiting the number of building permits that the county can issue to 280 per year. Implementation of

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this ordinance was delayed due to legal actions at the State Supreme Court and District Court levels. In June 2007, the Douglas County Board of Commissioners approved a Growth Management Ordinance that revoked the initiative and established a two percent compounded growth rate for residential building permits over the next 50 years. The ordinance allows Douglas County to issue up to a maximum of 379 residential building permits in 2016 and up to 609 permits in 2040. However, the actual number of permits issued since the Growth Management Ordinance went into effect in 2007 has been well below the maximum allowed. Refer to Table 2.2, Annual Residential Permits Issued—2000 to 2014.

A travel forecast model is the tool commonly used to determine future traffic levels on the street system. For the purpose of the *2016 Douglas County Transportation Plan*, the travel forecast model developed for the 2007 Transportation Plan has been updated to reflect the current population, employment and highway network information for Carson City and Douglas County.

The updated travel forecast model includes both Douglas County and Carson City because these counties are connected geographically and economically. The residential and commercial growth in one area affects the growth and development of the adjacent area as people constantly travel between counties for housing, employment, health care and recreation. Table 2.4 shows the residential and employment data for 2014 and projections for 2040 that are used in the model. The table provides a summary of planning variables used in the model for the Douglas County portion of the two-county model.

Table 2.4: Douglas County Land Use/Employment Data Traffic Forecast Model—2014 to 2040

	DOUGLAS COUNTY LAND USE DATA					
	2014 Model*	2025 Historic Growth**	2040 Historic Growth**	2040 Very Slow Growth**	2040 Low Growth**	2040 Maximum Growth**
Population	46,931	57,214	70,376	50,161	63,419	82,747
Dwelling units	23,640	28,096	33,607	25,096	30,694	38,788
Occupied dwelling units	19,610	23,791	29,128	20,927	26,307	34,145
Total employment	19,761	24,608	30,812	21,281	27,533	36,644
Hotel employment	3,283	3,525	3,834	3,359	3,670	4,125
Office employment	3,953	5,675	7,880	4,493	6,715	9,952
Industrial employment	3,590	4,588	5,866	3,903	5,191	7,068
Retail employment	4,146	5,848	8,028	4,583	6,876	9,003
Retail shop employment	1,953	1,999	2,058	1,967	2,027	2,113
Commercial shop employment	1,593	2,535	3,741	1,888	3,104	4,874
Other retail employment	600	1,314	2,229	824	1,745	3,088
Non-retail employment	4,789	4,971	5,204	4,846	5,081	5,424
Elementary and middle school	5,144	6,271	7,714	5,497	6,951	9,070
High school enrollment	1,785	2,176	2,677	1,908	2,412	3,147
College enrollment	705	859	1,057	753	953	1,243

* Data from 2010 U.S. Census

** Growth rates applied to Nevada State Demographer 2013 data.

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The Douglas County travel demand model reflects a 55.9 percent growth in employment from 2013 to 2040. Table 2.4 depicts employment by model category as the number of employees increase from 19,761 to 30,812. While the Nevada DETR reports an employment count of 17,954 non-farm jobs within Douglas County for 2014 (Table 2.3), 19,761 jobs were located geographically (based on the midpoint of employer specific count ranges), and assigned to a traffic analysis zone for traffic modeling purposes.

The following assumptions are included in the travel forecast model:

- Employment in Douglas County is expected to increase, in spite of the declining trend observed from 2005 to 2014.
- Population and employment growth has been distributed to traffic analysis zones based on the Master Plan land use designations in effect in 2015. Population growth has been distributed primarily to the receiving areas, while employment growth has been distributed to known areas of existing or planned employment.
- The travel model includes the housing developments approved by Douglas County and listed in Table 2.5 as projects with vesting for the administration of Building Permit Allocation and Growth Management Ordinance. The travel model also includes the future development associated with the North Douglas County Specific Plan identified in Table 2.6, Approved Specific Plans.

Most of the residential growth in the County is expected to be located in the Minden/Gardnerville area, generally bounded by Johnson Lane on the north, East Valley Road on the east, the Gardnerville Ranchos to the south, and SR 88 and U.S. 395 north of Buckeye Road on the west. Table 2.5 provides a list of tentatively approved subdivisions county-wide. The building permit allocations identified in the table are built into the travel demand model as future residential units for the years 2025 and 2040. These future units are reflected on Figure 2.5 which illustrates the projected residential growth in Carson Valley from 2010 to 2040.

Figure 2.6 illustrates the projected employment growth in Carson Valley from 2010 to 2040. The majority of the projected employment growth occurs in and around the Minden/Gardnerville area, including the area around the Minden–Tahoe Airport. A minor amount of new commercial development is projected for the area south of Gardnerville along U.S. 395. Additional commercial developments are planned for the northern most part of the county along U.S. 395.

2.3 Commute Patterns within Douglas County and Carson City

There is a fairly even balance between Douglas County in-commuting and out-commuting. The 2010 U.S. Census “Journey to Work” report data shows 7,528 commuters leaving Douglas County for work and 7,854 commuters coming into Douglas County for work. The largest numbers of out-commuters (4,394) travel to Carson City. The largest numbers of in-commuters (4,046) travel from El Dorado County, primarily to work for employers in the Lake Tahoe area.

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Table 2.5: Tentatively Approved Residential Subdivisions—Carson Valley, Topaz/Holbrook, and Tahoe Planning Areas (as of May 2016)

PROJECT NAME	VESTED LOTS (Resolution #200R-082)	LOTS PLATTED THROUGH APRIL 2016	LOTS BUILT OUT	STATUS	VESTED ALLOCATIONS REMAINING	COMMUNITY
Rain Shadow (Aloha) Ranch (PD 04-002-1)	43	17	7	Partially expired	10	GV Ranchos
Anker Park/Ranch at Gardnerville (PD04-008-04)	633	71	70	Active	562	Minden/Gardnerville
Arbor Gardens (LDA 07-040)	160	160	160	Built-out	0	Minden/Gardnerville
Ashland Park (H&S) (PD 05-013)*	292	0	0	Expired	0	East Valley
Cedar Creek PD (PD 04-009) **	67	67	27	Active	40	GV Ranchos
Chichester Estates†	785	764	763	Active	1	Minden/Gardnerville
Clear Creek LLC (Master Plan approved 11/2003)	384	0	0	Active	384	Sierra
Eagle Ridge PD (PD 04-001)	58	55	6	Active	52	Genoa
Faiss (Sorensen Subdivision) (LDA 05-075)	7	7	7	Built-out	0	GV Ranchos
Finch Ranch (Serial TPM, LDA 04-088, -089)	14	14	1	Active	13	Fish Springs
Genoa Lakes PD	220	220	208	Active	12	Genoa
Grandview Estates PD‡	182	64	5	Active	59	East Valley
Huntsinger PD	5	5	1	Active	4	East Valley
James Canyon PD/Montana	395	217	138	Active	257	Genoa
Jilk (Saddlerock) (LDA 06-030, -070, -071)	7	7	0	Active	7	Ruhenstroth
Job's Peak Ranch PD	122	122	61	Active	61	Genoa
Kahn PD	6	0	0	Active	6	Topaz Lake
Kit Carson PD ***	59	59	11	Active	48	GV Ranchos
La Costa PD (NV Northwest) (PD 02-004)****	138	71	46	Active	25	Minden/Gardnerville
Landmark Communities PD (PD 04-007)*	31	0	0	Expired	0	Minden/Gardnerville
Mason (Morgan Meadows) (LDA 05-085)	9	9	4	Active	5	Indian Hills
Mica Dr. LLC (Cottages at Indian Hills) (PD 05-002)	48	24	0	Active	48	Indian Hills
Monterra PD (Park Place)*****	270	118	90	Active	28	Minden/Gardnerville
Mossdale PD (NV Northwest)*	37	0	0	Expired	0	Minden/Gardnerville
Nevada Northwest (Specific Plan adopted 11/1/2001)	303	0	0	Active	303	Minden/Gardnerville
Parkhaven (Armit)	21	0	0	Expired	0	Johnson Lane
Pleasantview (currently in Phase 7)	199	195	194	Active	1	GV Ranchos
Ranchos Sierra LLC PD (PD 05-009)*	302	0	0	Expired	0	GV Ranchos
Rocky Terrace Estates PD	90	90	55	Active	35	GV Ranchos
Sage Crest PD	13	13	0	Active	13	Johnson Lane
Saratoga Springs PD (Phase 8)	543	543	489	Active	54	Johnson Lane
SDB, LLC PD	8	8	0	Active	8	East Valley
Settelmeyer PD (PD 04-006)*	84	0	0	Expired	0	Ruhenstroth
Sikora*	10	0	0	Expired	0	GV Ranchos
Silveranch Estates	141	135	135	Active	6	GV Ranchos
Skyline Ranch§	132	131	130	Active	1	East Valley
Sterling Ranch Estates PD	32	32	30	Active	2	Gardnerville
Stodick Estates South PD	121	121	121	Built-out	0	Minden/Gardnerville
Stone Creek LLC*	72	0	0	Expired	0	GV Ranchos
Sunridge Heights III (currently in Phase 7)	278	278	272	Active	6	Indian Hills
Valley Vista I (currently in Phase 7)	261	225	225	Active	36	Indian Hills
Virginia Ranch (Specific Plan adopted 2/2/2004)	1,020	0	0	Active	1,020	Minden/Gardnerville
Totals	7,602	3,842	3,249		3,114	

Source: Douglas County Assessor/GIS Division/Community Development Department

Notes: PD = planned development; last recorded map phase is indicated in parentheses ()

*Expired projects. Available allocations have been changed to zero for projects that have expired.

**Does not include the clubhouse lot, which will require a building permit allocation.

***Excluding 140-unit Heritage NV senior housing project, which has expired.

****La Costa—71 of the 138 lots were recorded prior to expiration.

*****Monterra PD—118 lots were recorded prior to expiration.

†764 platted lots

‡Phase 2 expired; 64 vested allocations remain

§131 platted lots

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Table 2.6: Approved Specific Plans—Carson Valley, Topaz/Holbrook and Tahoe Planning Areas (as of March 15, 2016)

SPECIFIC PLAN	COMMUNITY	ALLOWED NUMBER OF UNITS	MINUS UNITS/ LOTS RECORDED OR TENTATIVELY APPROVED	EXPIRED UNITS/ LOTS	TOTAL REMAINING UNITS/ LOTS TO RECORD
North Douglas County Specific Plan (adopted September 7, 2000)	Indian Hills	834	0	0	834
Corley Ranch Master Plan amendment (May 5, 2015)	Gardnerville	250	0	0	250
Total		1,084	0	0	1,084

Source: Douglas County Community Development Department

Carson City had 12,559 commuters enter from other counties, most significantly Douglas County (4,394), Lyon County (4,013) and Washoe County (3,576). There were 5,376 Carson City residents who left the county for work. Of these, 2,318 commuters went to Washoe County and 2,097 residents traveled to Douglas County.

Tables 2.7 and 2.8 provide a detailed breakdown of the commute patterns within Douglas County and Carson City as taken from the U.S. census data. These commute patterns indicate that a substantial amount of employment related travel occurs between Douglas County, Carson City and Washoe County. Due to the land use patterns and the limited number of parallel routes, much of this traffic is funneled through the U.S. 395 corridor.

U.S. census data within Douglas County and Carson City provide information on the mode of travel to work. Table 2.9 provides separate totals of modes of travel to work for Nevada, Douglas County, Carson City, and the two counties combined. The ratios of each transportation mode for the two counties are similar to the state averages in almost all categories. The main exception is the category of public transit, where Douglas County and Carson City average 0.8 percent use compared to the statewide average of 3.8 percent. The main users of the transit service in the study area are the elderly and persons with disabilities. Due to the rural nature of this area, transit service is not geared toward transporting working persons. Since the 2000 U.S. Census, Jump Around Carson has provided regular transit service in Carson City, which should increase the percentage of public transit use in the area.

Two interesting statistics emerge from Table 2.9: (1) 13 percent of the work trips involve a two-or-more person carpool and (2) 3.4 percent of the work trips are made by walking or bicycling. This data indicates that a significant number of commuters are already using alternatives to the single-occupant vehicle, with minimal marketing or external incentive.

Figure 2.5: Household Growth by Traffic Analysis Zone

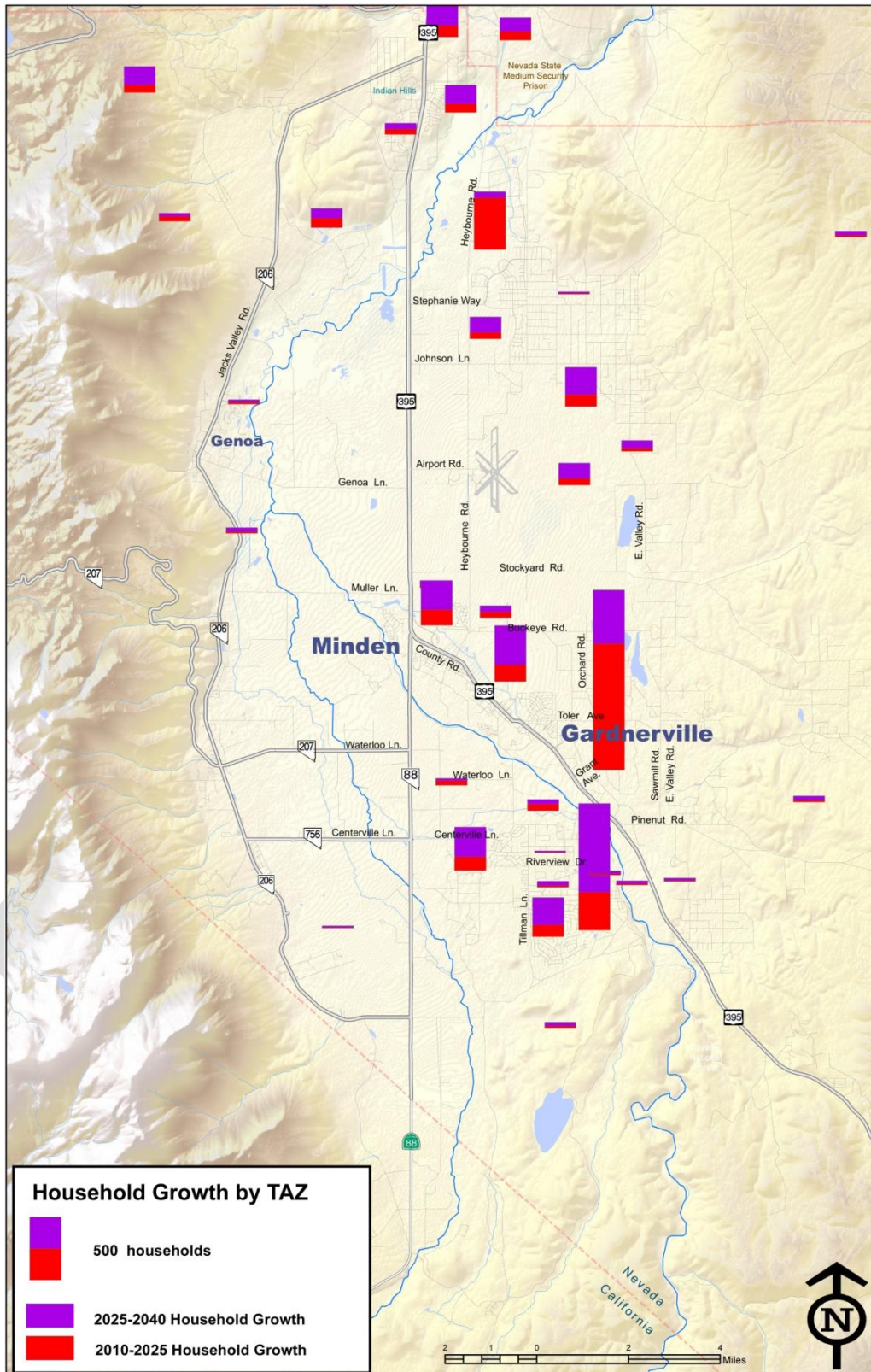
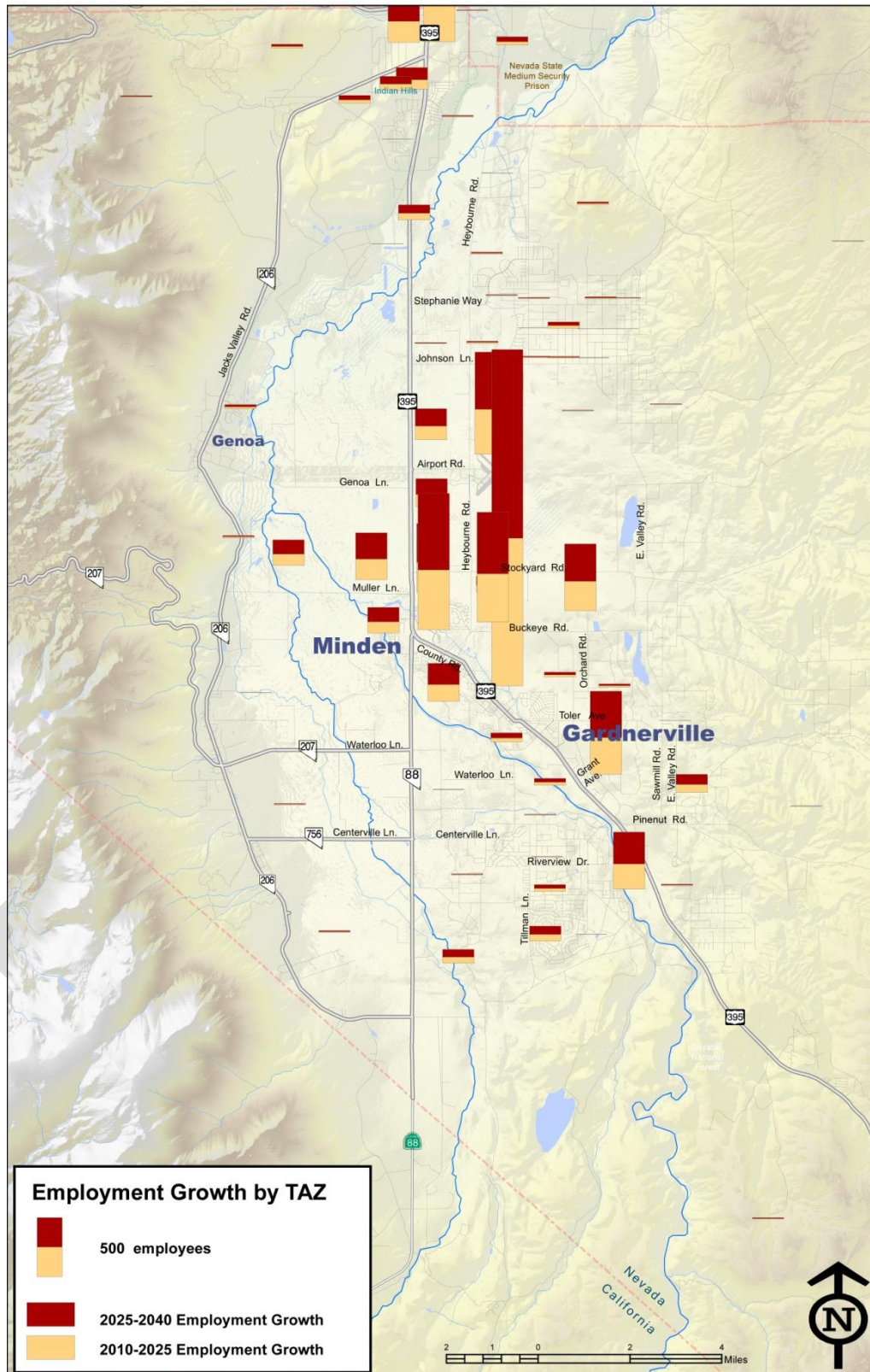


Figure 2.6 Carson Valley Projected Employment Growth by Traffic Analysis Zone



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Table 2.7: Journey to Work Sorted by Workplace County for Douglas County and Carson City

RESIDENCE COUNTY	WORKPLACE COUNTY	COUNT
Total Douglas County Commuters		21,772
Douglas County, Nevada	Douglas County, Nevada	13,918
Commuters entering into Douglas County from other counties		7,854
*El Dorado County, California	Douglas County, Nevada	4,046
*Carson City, Nevada	Douglas County, Nevada	2,097
*Lyon County, Nevada	Douglas County, Nevada	652
*Washoe County, Nevada	Douglas County, Nevada	564
Commuters entering Douglas County from * areas		7,359
Commuters entering Douglas County from other areas		495
RESIDENCE COUNTY	WORKPLACE COUNTY	COUNT
Total Carson City Commuters		31,214
Carson City, Nevada	Carson City, Nevada	18,655
Commuters entering into Carson City from other counties		12,559
*Douglas County, Nevada	Carson City, Nevada	4,394
*Lyon County, Nevada	Carson City, Nevada	4,013
*Washoe County, Nevada	Carson City, Nevada	3,576
Commuters entering Carson City from * areas		11,983
Commuters entering Carson City from other areas		576

Source: 2010 U.S. Census

Table 2.8: Journey to Work Sorted by Residence County for Douglas County and Carson City

RESIDENCE COUNTY	WORKPLACE COUNTY	COUNT
Total Douglas County Commuters		21,446
Douglas County, Nevada	Douglas County, Nevada	13,918
Commuters leaving Douglas County to other counties		7,528
Douglas County, Nevada	*Carson City, Nevada	4,394
Douglas County, Nevada	*Washoe County, Nevada	1,058
Douglas County, Nevada	*El Dorado County, California	983
Commuters leaving Douglas County to * areas		6,435
Commuters leaving Douglas County to other areas		1,093
RESIDENCE COUNTY	WORKPLACE COUNTY	COUNT
Total Carson City Commuters		24,031
Carson City, Nevada	Carson City, Nevada	18,655
Commuters leaving Carson City to other counties		5,376
Carson City, Nevada	*Washoe County, Nevada	2,318
Carson City, Nevada	*Douglas County, Nevada	2,097
Carson City, Nevada	*Lyon County, Nevada	731
Commuters leaving Carson City to * areas		5,146
Commuters leaving Carson City to other areas		230

Source: 2010 U.S. Census

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Table 2.9: Means of Transportation to Work (workers 16 years and older)

TRANSPORTATION MODE	NEVADA		DOUGLAS COUNTY		CARSON CITY		COMBINED CARSON CITY AND DOUGLAS COUNTY	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Drove alone	700,085	74.4%	14,775	75.6%	22,410	79.2%	37,185	77.7%
2-person carpool	111,620	11.9%	2,125	10.9%	3,110	11.0%	5,235	10.9%
3-or-more-person carpool	28,660	3.0%	380	1.9%	670	2.4%	1,050	2.2%
Bus or trolley bus	35,645	3.8%	245	1.3%	125	0.4%	370	0.8%
All other transit	460	0.0%	10	0.1%	0	0.0%	10	0.0%
Bicycle or walked	30,205	3.2%	690	3.5%	920	3.3%	1,610	3.4%
Taxicab, motorcycle, or other mode	11,035	1.2%	175	0.9%	275	1.0%	450	0.9%
Worked at home	23,875	2.5%	1,150	5.9%	780	2.8%	1,930	4.0%
Totals	941,585	100%	19,550	100%	28,290	100%	47,840	100%

Source: 2000 U.S. Census – most recent data available as of 2016.

Table 2.10 provides detailed information on travel times to work within the state of Nevada, Douglas County and Carson City. The greatest share of commuters (25 percent) in the study area travel between 10 and 14 minutes to work, with most commuters (89 percent) traveling between 5 and 44 minutes. Figure 2.7 illustrates that Douglas County and Carson City share a similar commute pattern, with a 5 to 10 minute shorter commute than the statewide average, which is heavily influenced by Clark County travel patterns.

Chapter 3 provides a more extensive discussion of the travel forecast model and its use in developing the transportation system reflected in the Transportation Plan.

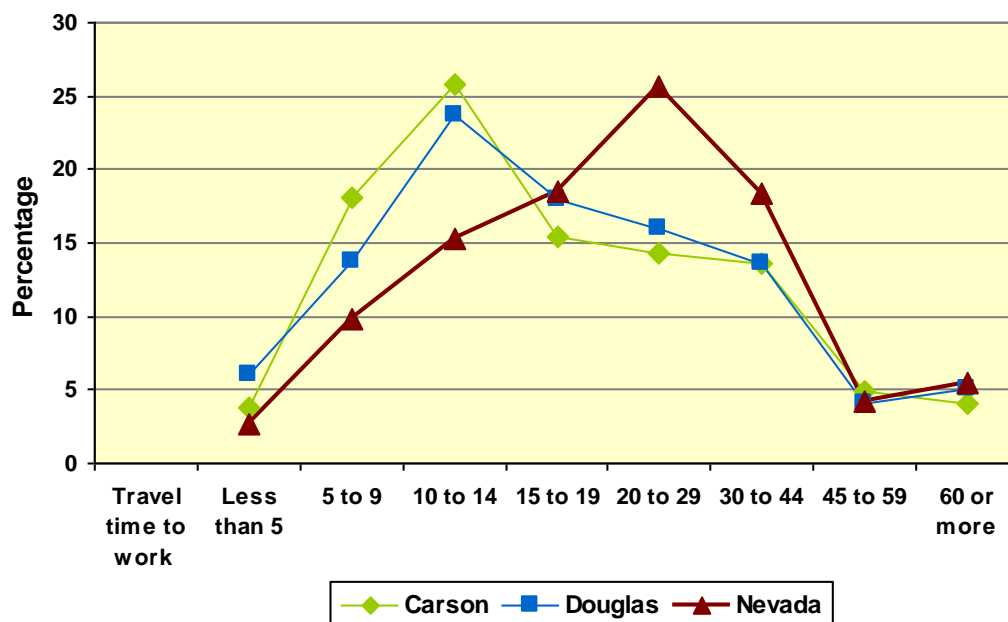
Table 2.10: Travel Time to Work (workers who did not work at home)

	NEVADA		DOUGLAS COUNTY		CARSON CITY	
	Estimate	Percent	Estimate	Percent	Estimate	Percent
Less than 5	24,695	2.7	1,105	6.0	1,060	3.9
5 to 9	89,890	9.8	2,520	13.7	4,985	18.1
10 to 14	139,740	15.2	4,355	23.7	7,085	25.8
15 to 19	169,305	18.4	3,295	17.9	4,245	15.4
20 to 29	235,470	25.7	2,930	15.9	3,935	14.3
30 to 44	168,750	18.4	2,510	13.6	3,725	13.5
45 to 59	39,075	4.3	750	4.1	1,345	4.9
60 or more	50,790	5.5	935	5.1	1,135	4.1
Mean travel time (minutes)	23.4	(X)	20.7	(X)	19.5	(X)
Median travel time (minutes)	20.2	(X)	15.4	(X)	15.2	(X)

Source: 2000 U.S. Census – most recent data available as of 2016.

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Figure 2.7: Cumulative Frequency Distribution of Travel Time to Work



2.4 Growth Policies

- 2.4.1 Evaluate the impacts of current and planned development in Douglas County.
- 2.4.2 Coordinate transportation planning and land use development.

Chapter 3

DOUGLAS COUNTY/CARSON CITY TRAVEL DEMAND MODEL

Transportation policy makers rely on travel analysis tools to evaluate the impacts of land use development and the need for infrastructure improvements. A travel demand model is one of the key technical analysis tools used for this evaluation. It uses a complex computer program to provide answers to “what if” questions about the effects of proposed development and land use policies. The model predicts travel behavior and travel demand within a specific area, over a particular time period.

3.1 How Travel Demand Modeling Works

A travel demand model uses a four-step process to create a simulation of current and future travel demands.

- Step 1. Trip generation (how many trips will people make?)
- Step 2. Trip distribution (where will people start and end their trips?)
- Step 3. Mode choice (which methods will people use to travel?)
- Step 4. Trip assignment (what routes will people take?)

To account for land use development, the study area is broken into individual traffic analysis zones, which are assigned a specific number of origin and destination trips based on such factors as residential, employment and retail activities. Once the travel model is developed, transportation planners can create a simulation of existing travel patterns. The model is then checked or “validated” to ensure that the assumptions are correct. When the model is sufficiently calibrated to accurately account for current travel patterns, it can be used to forecast future travel based on proposed changes to the land use or infrastructure.

For example, when a new residential development is proposed, the model can predict the number of people who will travel on local and regional streets to reach their school, shopping, recreation and/or employment destinations. If a specific roadway is added to the existing network, or an existing road is widened, the model predicts how many trips will travel on the newly improved facility. In this way, transportation improvements can be designed and constructed to coordinate with the needs of the new development.

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3.2 Overview of the Douglas County/Carson City Model

The Douglas County/Carson City travel demand model is designed to operate with TransCAD[®] software, which is used by the Nevada Department of Transportation (NDOT) for planning projects throughout the state. The detailed description of the modeling assumptions and analysis is available in a separate document, allowing Douglas County and NDOT model users to revise the model for future project analysis.

To provide a more accurate evaluation of travel patterns, the model encompasses transportation patterns in both Douglas County and Carson City. In addition to reflecting the regional nature of travel in these two counties, the shared model provides an opportunity for assisting policy makers with coordinating proposed land use and transportation improvements.

The travel demand model divides the two-county area into 324 internal traffic analysis zones and seven external traffic analysis zones for travel forecasting purposes. Figure 3.1 illustrates these boundaries on a map of the two counties. To increase model accuracy, traffic analysis zones that are located in urban areas have a smaller geographical area than those located in rural areas.

Some of the trips begin or end outside of the model area. These trips are assigned to locations where roads leave the county, called “external gateways.” Table 3.1 lists the locations of the external gateways used in the model.

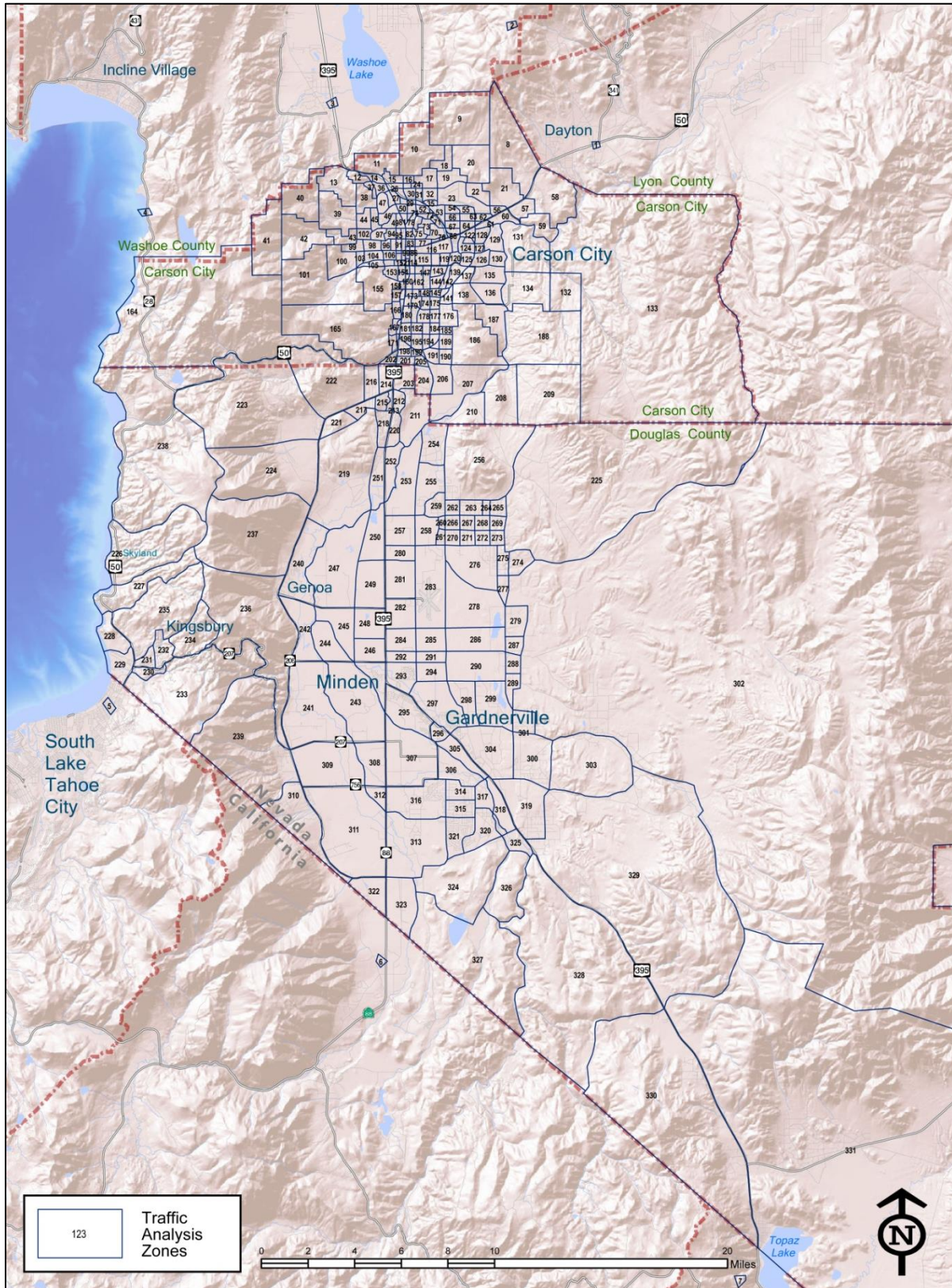
The model identifies the streets and highways that people use for travel. Appendix A, the Travel Demand Model, Figure 3.1 shows the 2014 Base Highway Network with the streets identified according to their functional classification (see Chapter 4 for more detail on the classification system). This network contains all major streets in the study area and their characteristics, such as the number of lanes and the historical traffic counts. Because of the technical requirements of the travel demand model, this map shows a slightly different functional classification network than the Douglas County map.

3.3 Forecasting in the 2016 Douglas County Transportation Plan

The Douglas County/Carson City travel demand model is a new and improved version of the travel forecasting models and model components previously developed for Douglas County and Carson City. To develop an accurate database for the model development, staff obtained residential data from the Douglas County Assessor’s office and employment data from the Nevada Department of Employment, Training and Rehabilitation. Median income data was obtained from the 2000 census data at the block group level and was appropriately distributed at the traffic analysis zone level. All data was adjusted for the model base year 2014.

[®] TransCAD is a registered trademark of Caliper Corporation.

Figure 3.1: Douglas County and Carson City Traffic Analysis Zone Map



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Table 3.1: External Gateways in the Travel Demand Model

GATEWAY/TAZ NO.	ROADWAY	LOCATION
1	U.S. 50	East end of Carson City
2	Goni Road	North end of Carson City
3	U.S. 395	North end of Carson City
4	State Route 28	West end of Carson City
5	U.S. 50	West end of Carson City
6	State Route 88	South end of Douglas County
7	U.S. 395	South end of Douglas County

Comparing the model results with actual traffic counts on the roadways indicated that the model was operating very accurately. This “model validation” took place using traffic counts at 69 locations in Douglas County and 103 locations in Carson City. The comparison was made for morning peak, evening peak, off-peak and daily traffic volumes. The counts showed an overall total deviation between the travel model and the actual traffic counts of three percent for morning peak travel, eight percent for evening peak travel, two percent for the off-peak travel and three percent for the daily travel. These variations are considered within allowable tolerances for planning purposes as described in Appendix A, Douglas County/Carson City Travel Demand Model report.

After validating the model for the base year 2014, Parsons ran the traffic model for the years 2025 and 2040 to determine the transportation system needs in the future. Please see Appendix A, *Douglas County/Carson City Travel Demand Model*, for a complete documentation of the travel demand model.

3.4 Travel Demand Model Policies

- 3.4.1 Update the travel demand on a regular basis, at least every ten years.
- 3.4.2 Maintain accurate data on population, employment and average daily traffic to facilitate travel model update.

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Chapter 4 STREETS AND HIGHWAYS

The Streets and Highways section provides a detailed discussion of the existing and proposed transportation network. This section explains the methods used for quantifying the transportation network, including traffic counts on Douglas County streets and highways, classification of streets into arterials, collectors and roadways, and methods for determining the traffic level of service. The section also discusses the major roadway issues in Douglas County, along with specific policies to maintain and improve the transportation network. This section includes three lists of projects. These lists are sorted by timeframe and need: (a) projects needed by 2025 to maintain LOS C on County roads and LOS D on Nevada Department of Transportation (NDOT) roads, (b) projects needed by 2040 to maintain LOS C on County roads and LOS D on NDOT roads, and (c) projects that provide alternate local and regional access.

4.1 Assessment of Existing Conditions

4.1.1 FUNCTIONAL CLASSIFICATION

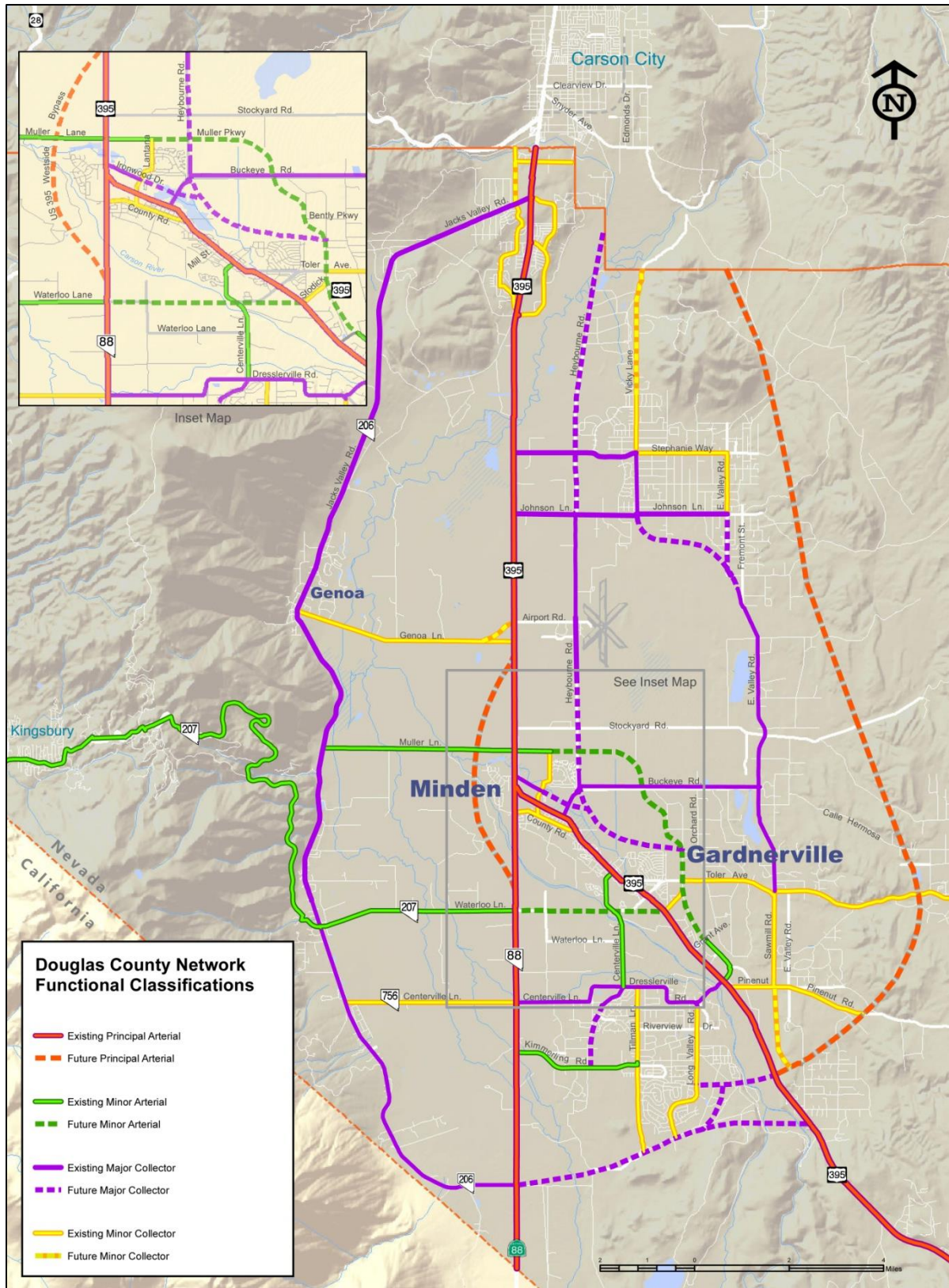
The first step in developing the transportation plan is to assess the condition of the existing street and highway network. Roadways are classified by the character of service they provide. Grouping types of roads based on their function allows for the development of road standards to meet travelers' mobility requirements. A brief discussion of the *Douglas County Engineering Design Criteria and Improvement Standards Manual* is included at the end of this section. A complete version of this document is available on the Douglas County website. To account for the technical requirements of the travel model, the roadway functional classification utilized in the model is slightly different from the highway network map shown on Figure 4.1. The following functional classification definitions are consistent with those adopted by the Nevada Department of Transportation (NDOT) in conformance with the United States Federal Aid Highway Law.

Principal Arterials

The rural principal arterial system consists of a connected rural network of continuous routes which serve corridor movements having trip lengths and travel density characteristics indicative of substantial state-wide or interstate travel. In addition, the rural principal arterial system serves essentially all urban areas with a population of 50,000 and over, and the majority of those with populations of 25,000 and over. The rural arterial system provides an integrated network without stub connections except where unusual geographic or traffic flow conditions dictate otherwise.

The rural principal arterial system is classified into the interstate system and other principal arterials. Within Douglas County, there are no roadways that are part of the interstate system, but there are several state highways that have been classified as other principal arterials. These roadways include U.S. 50, U.S. 395, State Route (SR) 28, SR 208, and SR 88. All of these roadways are maintained under the jurisdiction of NDOT.

Figure 4.1: Roadway Functional Classification Map



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Minor Arterials

The minor arterial street system interconnects with and augments the principal arterial system and provides service to trips of moderate length at a somewhat lower level of travel ability than the principal arterials. In addition, this system distributes travel to geographic areas smaller than those identified within the principal arterial system. Minor arterial street systems include all arterials not classified as principal and contain facilities that place more emphasis on land access than the principal arterial system. Minor arterial systems typically carry local bus routes and provide inter-community continuity, but ideally do not penetrate identifiable neighborhoods. The minor arterial street system includes urban connections to rural collector roads where such connections have not been classified as principal arterials.

Rural/Urban Major Collector

The rural/urban major collector system provides service to any central business district not on an arterial route, and into the larger towns not directly served by higher systems. In addition, major collector roads provide service to traffic generators of equivalent intra-county importance such as consolidated schools, county parks, important mining areas, etc. The rural/urban major collector roads link these places with nearby larger towns or cities or with routes of higher classifications. Rural/urban major collector roads serve the more important intra-county travel corridors.

Rural/Urban Minor Collectors

The rural/urban minor collector roadways are laid out consistent with population density in order to collect traffic from local roads and bring all developed areas within a reasonable distance of the collector road. In addition, they provide service to the remaining smaller communities and link locally important traffic generators within their rural areas.

Rural/Urban Local Roadway

The local street system comprises all facilities not on one of the higher systems. The local roadway system provides direct access to abutting land and access to higher order systems.

Figure 4.1 shows the Roadway Functional Classification for streets and highways as determined by the Douglas County Community Development Department. Rural and urban local streets and roads are not illustrated on this graphic.

4.1.2 EXISTING TRAFFIC LEVELS

The second step in developing the transportation plan is to inventory the volume of traffic using the existing transportation network. To undertake this inventory, data was collected from NDOT and field counts were taken at 26 road segments in Douglas County and Carson City during 2015. These traffic volume counts were taken during the morning and evening times when traffic levels are highest, generally between 6:00 and 9 a.m. and between 3:00 and 7:00 p.m.

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Tables 4.1 and 4.2 provide a.m. and p.m. peak hour traffic data along certain Douglas County road segments. The tables allow for traffic flow in two possible directions: north-south **OR** east-west. When reading the tables, one must first determine the directional orientation of the road. On a north/south oriented road, the left column provides information for the northbound direction and the right column provides the southbound traffic data. On a roadway with an east/west orientation, the left column provides data for the eastbound traffic; the right column provides data for the westbound traffic.

Table 4.3 shows historical trends of average daily traffic on selected county roadways from 2005 to 2014. Traffic during this period has generally decreased, with traffic volumes at a few locations remaining nearly unchanged.

4.1.3 QUANTITATIVE EVALUATION/LEVEL OF SERVICE

Level of service (LOS) is the term used by traffic engineers to explain how effectively a roadway segment or intersection is operating as perceived by the transportation system user. Similar to the grading system used in schools where “A” is the best and “F” is the worst, the six traffic levels of service range from LOS A (high speed and high residual capacity with minimal delay) to LOS F (low speed and no residual capacity with high levels of delay). Figure 4.2 illustrates levels of service at an urban intersection and Table 4.4 describes the conditions experienced at different levels of service at signalized intersections.

Existing traffic levels of service for Douglas County’s streets and highways were determined by comparing daily traffic volumes to typical roadway capacities. The vehicle volume to roadway capacity compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). This measure can alert transportation planners to areas where traffic mitigation measures should be considered. Volume to roadway capacity is often associated with determining the traffic level of service. While the levels of service may be estimated based on daily volumes and capacities, the ratings refer to peak hours of the day (typically morning and evening commute hours). During other hours, better levels of service would prevail.

Table 4.2 lists the traffic level of service and the vehicle volume-to-capacity ratio observed for the street segments which were counted for both morning and evening peak hours.

The roadway improvements described in this transportation plan are designed to maintain LOS C or better on all County-maintained roads, and LOS D or better on roads maintained by the Nevada Department of Transportation.



Table 4.1: Douglas County Roadway Segment Traffic Volumes

ROADWAY SEGMENTS	STATION NUMBER	AM PEAK HOUR		PM PEAK HOUR	
		North/East	South/West	North/East	South/West
Airport Road/SR 759–0.1 mile east of U.S. 395	50032	88	88	102	102
Buckeye Road east of U.S. 395	999999	238	266	283	345
Centerville Lane–175 feet east of Foothill Road	50062	74	74	92	92
Centerville Lane/SR 756–0.25 miles west of U.S. 395	50016	101	212	262	189
Centerville Lane/SR 756–550 feet east of SR 88	50018	114	160	228	151
County Road–300 feet east of SR 88	50064	119	119	167	167
Dresslerville Road–1,360 feet west of Tillman Lane	50074	98	98	130	130
Dresslerville Road–360 feet west of Tillman Lane	50075	199	199	292	292
Dump Road south of Pinenut Avenue	999999	72	82	76	70
East Valley Road–600 feet north of Pinenut Road	50051	31	31	41	41
East Valley Road north of Buckeye Road	999999	59	91	102	114
East Valley Road north of Fish Springs Road	999999	74	80	73	103
Fish Springs Road east of Valley Road	999999	61	103	114	66
Fish Springs Road west of Windmill Road	999999	24	43	45	31
Foothill Road/SR 206–0.1 mile north of Kingsbury Grade	50025	69	79	90	98
Foothill Road/SR 206–1.97 miles north of Muller Lane	50027	52	58	75	72
Foothill Road/SR 206–3.9 miles south of Centerville Lane	50022	27	12	11	22
Foothill Road/SR 207–775 feet south of Kingsbury Grade	50023	55	153	141	79
Fremont Avenue–0.5 miles south of Johnson Lane	50086	50	50	60	60
Genoa Lane/SR 206–400 feet west of U.S. 395	50028	47	50	43	70
Heybourne Road south of Johnson Lane	999999	79	69	50	91
Jacks Valley Rd–0.1 mile south of Alpine View Court	50048	61	61	66	66
Jacks Valley Rd–0.15 mile west of U.S. 395	50034	228	186	287	440
Jacks Valley Rd–0.4 miles north of Genoa Lane	50049	71	83	88	81
Johnson Lane–0.125 miles east of U.S. 395	50052	196	196	223	223
Kimmerling Road–150 feet east of Short Court	50066	171	171	264	264
Kimmerling Road east of Rubio	999999	177	494	453	221



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Table 4.1: Douglas County Roadway Segment Traffic Volumes

ROADWAY SEGMENTS	STATION NUMBER	AM PEAK HOUR		PM PEAK HOUR	
		North/East	South/West	North/East	South/West
Kingsbury Grade/SR 207–0.3 miles west of Foothill Road	50024	254	177	171	310
Long Valley Road between Rancho Road and Watshemu Drive	50053	77	77	124	124
Long Valley Road south of Dresslerville	999999	264	224	257	467
Lucerne Street east of Ironwood Road	999999	114	148	105	131
Mica Drive west of U.S. 395	999999	120	142	140	183
Mottsville Lane–900 feet west of SR 88	50013	129	139	139	204
Muller Lane/SR 757–846 feet west of U.S. 395	50026	62	62	62	62
North Sunridge Drive–650 feet north of South Sunridge Drive	50084	27	27	39	39
Palomino Lane–0.123 miles east of U.S. 395	50071	32	32	43	43
Pinenut Road–0.5 miles east of U.S. 395	50050	71	71	86	86
Pinto Circle–255 feet north of Palomino Lane	50072	30	30	38	38
Plymouth Drive west of U.S. 395	999999	32	48	72	39
Riverview Drive–0.33 miles east of Dresslerville Road	50076	251	251	353	353
Stephanie Lane– 760 feet east of U.S. 395	50077	218	218	294	294
Stodick Lane east of U.S. 395	999999	64	104	120	87
Tillman Lane–500 feet north of Kimmerling Road	50073	81	81	220	220
Toler Avenue–150 feet east of Elges Avenue	50058	93	93	130	130
Toler Lane–1.3 miles east of Elges Avenue	50080	67	67	94	94
Vicki Lane–420 feet north of Johnson lane	50079	28	28	50	50
Vista Grande Boulevard west of Tourmaline Way	999999	139	80	116	176
Waterloo Lane–725 feet east of U.S. 395	50056	123	203	289	215
Waterloo Lane west of U.S. 395	999999	262	256	381	335
Zerolene Road east of U.S. 395	999999	8	8	11	15

Source: 2015 Parsons traffic counts (stations 999999) and 2014 Nevada Department of Transportation traffic counts

* ADT = average daily traffic

Table 4.2: Traffic Level of Service and Vehicle Volume to Capacity Ratio

ROADWAY SEGMENT	STATION NUMBER	AM PEAK HOUR				PM PEAK HOUR			
		North/East		South/West		North/East		South/West	
		LOS*	V/C**	LOS	V/C	LOS	V/C	LOS	V/C
Airport Road/SR 759–0.1 mile east of U.S. 395	50032	A	0.13	A	0.13	A	0.15	A	0.15
Buckeye Road east of U.S. 395	999999	A	0.34	A	0.38	A	0.4	A	0.49
Centerville Lane–175 feet east of Foothill Road	50062	A	0.09	A	0.09	A	0.12	A	0.12
Centerville Lane/SR 756–0.25 miles west of U.S. 395	50016	A	0.14	A	0.3	A	0.37	A	0.27
Centerville Lane/SR 756–550 feet east of SR 88	50018	A	0.16	A	0.23	A	0.33	A	0.22
County Road–300 feet east of SR 88	50064	A	0.2	A	0.2	A	0.28	A	0.28
Dresslerville Road–1,360 feet west of Tillman Lane	50074	A	0.14	A	0.14	A	0.19	A	0.19
Dresslerville Road–360 feet west of Tillman Lane	50075	A	0.28	A	0.28	A	0.42	A	0.42
Dump Road south of Pinenut Avenue	999999	A	0.1	A	0.12	A	0.11	A	0.1
East Valley Road–600 feet north of Pinenut Road	50051	A	0.04	A	0.04	A	0.05	A	0.05
East Valley Road north of Buckeye Road	999999	A	0.07	A	0.11	A	0.13	A	0.14
East Valley Road north of Fish Springs Road	999999	A	0.09	A	0.1	A	0.09	A	0.13
Fish Springs Road east of Valley Road	999999	A	0.08	A	0.13	A	0.14	A	0.08
Fish Springs Road west of Windmill Road	999999	A	0.03	A	0.05	A	0.06	A	0.04
Foothill Road/SR 206–0.1 mile north of Kingsbury Grade	50025	A	0.09	A	0.1	A	0.11	A	0.12
Foothill Road/SR 206–1.97 miles north of Muller Lane	50027	A	0.07	A	0.07	A	0.09	A	0.09
Foothill Road/SR 206–3.9 miles south of Centerville Lane	50022	A	0.03	A	0.02	A	0.01	A	0.03
Foothill Road/SR 207–775 feet south of Kingsbury Grade	50023	A	0.07	A	0.19	A	0.18	A	0.1
Fremont Avenue–0.5 miles south of Johnson Lane	50086	A	0.08	A	0.08	A	0.1	A	0.1
Genoa Lane/SR 206–400 feet west of U.S. 395	50028	A	0.07	A	0.07	A	0.06	A	0.1
Heybourne Road south of Johnson Lane	999999	A	0.1	A	0.09	A	0.06	A	0.11
Jacks Valley Road–0.1 mile south of Alpine View Court	50048	A	0.08	A	0.08	A	0.08	A	0.08
Jacks Valley Road–0.15 mile west of U.S. 395	50034	A	0.16	A	0.13	A	0.21	A	0.31
Jacks Valley Road–0.4 miles north of Genoa Lane	50049	A	0.09	A	0.1	A	0.11	A	0.1
Johnson Lane–0.125 miles east of U.S. 395	50052	A	0.28	A	0.28	A	0.32	A	0.32
Kimmerling Road–150 feet east of Short Court	50066	A	0.29	A	0.29	A	0.44	A	0.44
Kimmerling Road east of Rubio	999999	A	0.3	D	0.82	C	0.76	A	0.37

Table 4.2: Traffic Level of Service and Vehicle Volume to Capacity Ratio

ROADWAY SEGMENT	STATION NUMBER	AM PEAK HOUR				PM PEAK HOUR			
		North/East		South/West		North/East		South/West	
		LOS*	V/C**	LOS	V/C	LOS	V/C	LOS	V/C
Kingsbury Grade/SR 207–0.3 miles west of Foothill Road	50024	A	0.32	A	0.22	A	0.21	A	0.39
Long Valley Road between Rancho Road and Watshemu Drive	50053	A	0.13	A	0.13	A	0.21	A	0.21
Long Valley Road south of Dresslerville	999999	A	0.44	A	0.37	A	0.43	C	0.78
Lucerne Street east of Ironwood Road	999999	A	0.19	A	0.25	A	0.18	A	0.22
Mica Drive west of U.S. 395	999999	A	0.2	A	0.24	A	0.23	A	0.31
Mottsville Lane–900 feet west of SR 88	50013	A	0.18	A	0.2	A	0.2	A	0.29
Muller Lane/SR 757–846 feet west of U.S. 395	50026	A	0.09	A	0.09	A	0.09	A	0.09
North Sunridge Drive–650 feet north of South Sunridge Drive	50084	A	0.05	A	0.05	A	0.07	A	0.07
Palomino Lane–0.123 miles east of U.S. 395	50071	A	0.05	A	0.05	A	0.07	A	0.07
Pinenut Road–0.5 miles east of U.S. 395	50050	A	0.1	A	0.1	A	0.12	A	0.12
Pinto Circle–255 feet north of Palomino Lane	50072	A	0.05	A	0.05	A	0.06	A	0.06
Plymouth Drive west of U.S. 395	999999	A	0.05	A	0.08	A	0.12	A	0.07
Riverview Drive–0.33 miles east of Dresslerville Road	50076	A	0.36	A	0.36	A	0.5	A	0.5
Stephanie Lane–760 feet east of U.S. 395	50077	A	0.36	A	0.36	A	0.49	A	0.49
Stodick Lane east of U.S. 395	999999	A	0.11	A	0.17	A	0.2	A	0.15
Tillman Lane–500 feet north of Kimmerling Road	50073	A	0.14	A	0.14	A	0.37	A	0.37
Toler Avenue–150 feet east of Elges Avenue	50058	A	0.13	A	0.13	A	0.19	A	0.19
Toler Lane–1.3 miles east of Elges Avenue	50080	A	0.1	A	0.1	A	0.13	A	0.13
Vicki Lane–420 feet north of Johnson lane	50079	A	0.04	A	0.04	A	0.07	A	0.07
Vista Grande Boulevard west of Tourmaline Way	999999	A	0.23	A	0.13	A	0.19	A	0.29
Waterloo Lane–725 feet east of U.S. 395	50056	A	0.18	A	0.29	A	0.41	A	0.31
Waterloo Lane west of U.S. 395	999999	A	0.37	A	0.37	A	0.54	A	0.48
Zerolene Road east of U.S. 395	999999	A	0.01	A	0.01	A	0.02	A	0.03

Source: 2015 Parsons traffic counts (stations 999999) and 2014 Nevada Department of Transportation traffic counts

* LOS = level of service

** V/C = volume to capacity



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Table 4.3: Historic Traffic Levels at Select Locations (Average Daily Traffic)

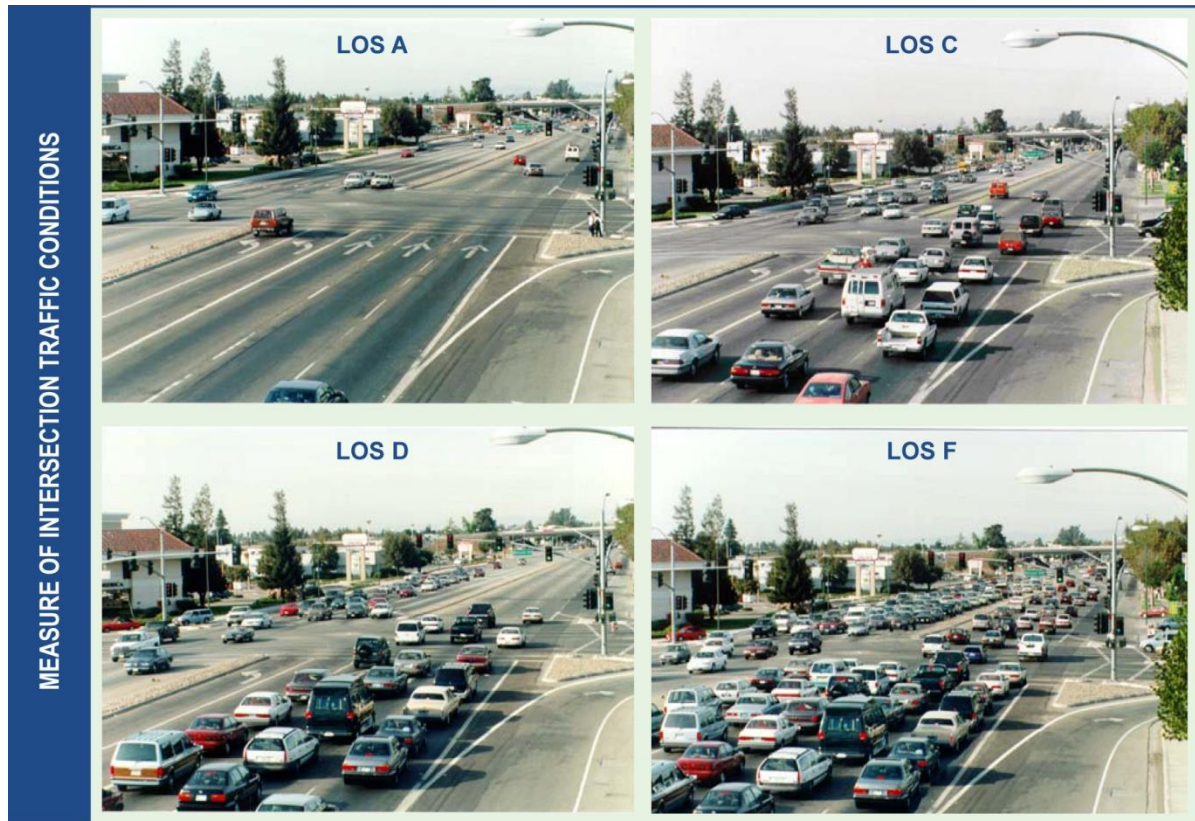
LOCATION	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Airport Road–0.1 mile east of U.S. 395	2,700	2,550	3,000	2,500	2,600	2,300	2,500	2,200	2,200	2,200
Centerville Lane north of Dresslerville Road	8,800	8,850	8,700	8,500	8,500	8,300	8,200	8,000	7,400	7,500
Centerville Lane–175 feet east of Foothill Road	2,450	1,900	2,500	2,400	2,300	2,200	2,200	1,900	1,900	2,100
Centerville Lane–550 feet east of SR 88	4,300	4,250	4,200	3,900	3,800	4,000	3,800	4,000	3,900*	4,200
County Road–300 feet east of SR 88	3,150	3,100	4,100	3,700	3,600	3,700	3,500	3,100	3,400	3,200
Genoa Lane–400 feet south of U.S. 395	1,450	1,450	1,500	1,500	1,300	1,400	1,500*	1,300	1,100	1,500*
Jacks Valley Road–0.15 mile west of U.S. 395	11,000	11,100	10,000	9,400	8,600	8,500*	8,400	8,300*	8,600	8,300*
Johnson Lane–0.125 mile east of U.S. 395	7,250	7,250	6,600	5,700	5,900	5,100	4,600	5,000	5,200	5,200
Kimmerling Road–50 feet east of Short Court	7,300*	6,900*	6,600	6,200	6,200	5,700	5,900	5,600	5,600	5,600
Kingsbury Grade–0.3 mile west of Foothill Road	5,700	5,700	5,700*	5,700	5,100	5,000*	4,200	4,300	5,100	5,900
Kingsbury Grade–350 feet east of U.S. 50	14,600*	14,300*	13,000	14,000	13,000	14,000	14,000*	12,000*	12,000	12,000*
Mottsville Road–900 feet west of SR 88	4,050	4,050	4,100	4,600	4,300	4,000	4,000*	3,700	3,600	4,000
Muller Lane Parkway–846 feet west of U.S. 395	1,500*	1,650*	1,500	1,700	1,500	1,000	1,500	1,200	1,300	1,500
Pinenut Road–0.5 mile east of U.S. 395	3,300	3,250	3,600	3,300	3,000	2,600	2,500	2,000	2,300	2,500
SR 208–1 mile east of U.S. 395	4,100	4,150	4,000*	3,600	3,800	3,400	3,200	3,000	3,100	3,100*
SR 756 (Centerville)–0.25 mile west of U.S. 395	6,600	6,650	5,400	5,600	5,500	5,100	5,300*	5,200	4,900	5,300
SR 88–0.6 mile south of County Road	12,000	12,100*	13,000	12,000	12,000	11,000	11,000	11,000	11,000	11,000*
Toler Avenue–150 feet east of Elges Road	3,900	4,050	4,200	4,000	4,000	3,700	3,300	3,400	3,200	3,100
U.S. 395–0.25 mile south of Muller Lane Parkway	32,500	32,000	29,000	28,000	28,000	27,000	26,000*	26,000*	27,000	28,000
U.S. 395–0.4 mile north of Jacks Valley Road	45,500	46,000	44,000*	41,000	40,000	38,000	37,000	36,000*	36,000*	38,500
U.S. 395–700 feet south of SR 88	27,700	25,900	26,000	24,000	24,000	24,000	23,000*	23,000*	22,000	21,500
U.S. 50–300 feet east of SR 207	27,700	23,700	20,000	20,000	21,000	22,000*	24,000	21,000	22,000	25,000
Waterloo Lane–0.275 mile east of SR 88	2,200	2,250	2,100	2,100	2,000	1,900	1,700	1,400	1,400	1,800
Waterloo Lane–725 feet east of U.S. 395	6,900	7,400	7,200	7,200	7,400	6,600	6,400	5,900	5,800	5,600

Source: Nevada Department of Transportation

* Data adjusted or estimated.

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Figure 4.2: Traffic Level of Service Illustration



Source: City of San Jose

Table 4.4: Level of Service Definitions

LOS	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION	ROADWAY (DAILY)
A	Uncongested operations; all queues clear in a single signal cycle. <i>Average Delay < 5 sec</i>	Little or no delay. 0 to 4 second average delay	Free flow
B	Uncongested operations; all queues clear in a single cycle. <i>Average Delay 5 < 15 sec</i>	Short traffic delays. 5 to 9 second average delay	Free flow, presence of other vehicles noticeable.
C	Light congestion, occasional backups on critical approaches. <i>Average Delay 15 < 25 sec</i>	Average traffic delays. 10 to 19 seconds average delay	Ability to maneuver and select operating speed affected.
D	Significant congestions of critical approaches, but intersection functional. Cars must wait more than one cycle during short peaks. No long queues formed. <i>Average Delay 25 < 40 sec</i>	Long traffic delays. 20 to 29 seconds average delay	Unstable flow, speeds and ability to maneuver restricted.
E	Severe congestion; long queues on critical approaches. Blockage of intersection if no protected turning movements. Traffic queue may block nearby intersections upstream of critical approaches. <i>Average Delay 40 < 60 sec</i>	Very long traffic delays, failure, extreme congestion. More than 30 seconds average delay	At or near capacity, flow quite unstable.
F	Total breakdown, stop-and-go operation. <i>Average Delay > 60 sec</i>	Intersection blocked by external causes.	Forced flow, breakdown.

Source: 2010 Highway Capacity Manual

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Table 4.5 compares Douglas County's threshold volumes for LOS A through LOS E with the Florida Department of Transportation, a widely used reference, and Parsons' standard for rural areas that are transitioning into urban areas. This table is used to evaluate the future level of service on roadways with different functional classifications. Generally, the Douglas County threshold is a slightly lower number than the other standards, resulting in facilities being rated at a lower level of service than similar facilities in other areas with the same traffic volume. This differential is only minor, indicating that Douglas County's level of service threshold volumes are appropriate for this area.

Table 4.5: Level of Service Threshold Volumes Comparison of Methodologies

ROADWAY TYPE		MAXIMUM TOTAL DAILY VEHICLES IN BOTH DIRECTIONS (ADT)				
		A	B	C	D	E
6-lane freeway	Parsons	67,500	78,750	90,000	101,250	112,500
	Florida DOT*	NA	65,100	85,600	102,200	111,000
	Douglas County	NA	NA	NA	NA	NA
	2014 Thresholds	67,500	78,750	90,000	101,250	112,500
4-lane freeway	Parsons	45,000	52,500	60,000	67,500	75,000
	Florida DOT	NA	44,100	57,600	68,900	71,700
	Douglas County	NA	NA	NA	NA	NA
	2014 Thresholds	45,000	52,500	60,000	67,500	75,000
4-lane expressway	Parsons	28,800	33,600	38,400	43,200	48,000
	Florida DOT**	NA	35,300	49,600	62,900	69,600
	Douglas County	NA	NA	NA	NA	NA
	2014 Thresholds	28,800	33,600	38,400	43,200	48,000
6-lane major arterial	Parsons	36,000	42,000	48,000	54,000	60,000
	Florida DOT†	NA	NA	52,100	53,500	NA
	Douglas County	NA	NA	36,000	43,200	48,000
	2014 Thresholds	28,000	32,000	36,000	43,200	48,000
4-lane major arterial	Parsons	24,000	28,000	32,000	36,000	40,000
	Florida DOT†	NA	NA	34,000	35,500	NA
	Douglas County	NA	NA	24,000	28,800	32,000
	2014 Thresholds	18,000	20,000	24,000	28,800	32,000
4-lane minor arterial	Parsons	21,600	25,200	28,800	32,400	36,000
	Florida DOT‡	NA	NA	22,700	28,800	31,600
	Douglas County	NA	NA	21,000	NA	28,000
	2014 Thresholds	15,000	18,000	21,000	25,000	28,000
4-lane collector	Parsons	18,000	21,000	24,000	27,000	30,000
	Florida DOT	NA	NA	11,500	25,500	28,900
	Douglas County	NA	NA	21,000	NA	28,000
	2014 Thresholds	15,000	18,000	21,000	25,000	28,000
2-lane collector	Parsons	9,000	10,500	12,000	13,500	15,000
	Florida DOT¶	NA	NA	4,200	9,600	12,100
	Douglas County	NA	NA	10,500	NA	14,000
	2014 Thresholds	7,500	9,000	10,500	12,500	14,000

* Areas transitioning into urbanized areas

** Uninterrupted flow highways

† 0.00 to 1.99 signalized intersections per mile

‡ 2.00 to 4.50 signalized intersections per mile

¶ Non-state roadways in Florida

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For example, a 4-lane minor arterial reaches the Douglas County level of service maximum of LOS C at 21,000 ADT. For the same type of facility, Parsons recommends a 28,800 vehicle maximum and the Florida Department of Transportation allows a maximum of 22,700 vehicles. Douglas County has a stricter designation of what constitutes a significant level of delay caused by traffic than the comparison areas. The travel demand model and ADT volumes indicate that all of the County-maintained roadways are currently operating at LOS B or better during peak times, except Riverview Drive and Stephanie Way from U.S. 395 to South Santa Barbara Drive, which are operating at LOS C. All of the NDOT-maintained roads are currently operating at LOS D or better, except U.S. 395 from Mica Drive to I-580 in Carson City which is operating at LOS F, and U.S. 395 from Muller Parkway to SR 88, which is operating at LOS E.

The 2014 level of service thresholds, shown in **bold** text in Table 4.5, are the thresholds used in the Douglas County/Carson City Travel Demand Model to evaluate the level of service for Douglas County based on the functional classifications established by the County and shown on Figure 4.1.

4.1.4 EXISTING PERFORMANCE AND NEAR-TERM CHALLENGES

At the current time, a significant transportation issue in Douglas County is the concern about traffic safety and capacity along the U.S. 395 corridor through the towns of Gardnerville and Minden. U.S. 395 is the primary corridor through Carson Valley, with a limited number of parallel roads that could absorb any through traffic. In addition, U.S. 395 transitions into historic Main Street through the towns of Gardnerville and Minden, where many local commercial and retail businesses front on the highway. People and vehicles accessing those businesses have conflicts with the motorists who want to travel through these commercial areas as quickly as possible. Another consequence of through traffic being funneled onto U.S. 395/Main Street is that pedestrians and bicyclists have difficulty crossing the highway safely.

In 2007, NDOT completed the *U.S. 395 Southern Sierra Corridor Study*, which considers many of these issues. The study recommends working closely with Douglas County to implement roadway safety and capacity improvement projects.

Douglas County grew steadily from 1990 through 2005. Since that time, growth has slowed considerably, but has recently begun to accelerate. (Refer to Table 2.2, Annual Residential Permits Issued, Dwelling Units Constructed.) The existing transportation infrastructure has been able to cope with the effects of this growth, preserving acceptable traffic flow (LOS C on Douglas County facilities, LOS D on NDOT facilities) on most roadways.

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Under existing road network and traffic conditions, the travel demand model and ADT volumes indicate that two road segments are currently experiencing level of service (LOS) deficiencies:

Existing LOS Deficiencies with Existing Road Network (no projects)

Road Segment	LOS
U.S. 395 from U.S. 50 to Mica Drive	F
U.S. 395 Muller Lane to SR 88	E

Given the magnitude of the projects needed address these LOS deficiencies, it is virtually impossible that they can be addressed in the short-term. Accordingly, the projects needed to address these deficiencies are included in the list of project for completion by 2025. Nevertheless, it should be noted that the County's 2016 5-Year Transportation Plan indicates that Buckeye Road is planned to be connected to U.S. 395 north of Minden via Heybourne Road and Muller Parkway no later than 2017. Although this connection is not anticipated to improve the LOS on U.S. 395 from Muller Lane to SR 88, it will provide an alternate route for some drivers.

4.2 Vision/Guiding Policies and Principles

The 2007 *Douglas County Transportation Plan* identified the following policies:

- 4.2.1 Identify high accident locations and take appropriate actions to ensure continued public health and safety.
- 4.2.2 Provide appropriate traffic control devices on new and existing transportation facilities.
- 4.2.3 Protect public safety by removing snow and other hazards from roadways.
- 4.2.4 Post appropriate speed limits based on current speed limit studies.
- 4.2.5 Remove litter, trash and debris from the roadside and the right-of-way to keep roadways within Douglas County aesthetically pleasant.
- 4.2.6 Implement selected near-term traffic safety and traffic operations improvements from 2016 to 2020.
- 4.2.7 Implement mid-term road improvements to provide acceptable traffic operations from 2016 to 2025.
- 4.2.8 Implement long-term road improvements to provide capacity and mobility from 2026 to 2040.
- 4.2.9 Maintain a traffic level of service "D" on all NDOT roads within Douglas County, consistent with NDOT standards.

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- 4.2.10 Develop a “pedestrian-friendly” U.S. 395/Main Street corridor through Minden and Gardnerville. (See Complete Streets Policy dated January 19, 2016.)
- 4.2.11 Support NDOT projects that maintain traffic flow (high speed and capacity) on U.S. 395 between Minden and Carson City, as identified in the *U.S. 395 Southern Sierra Corridor Study (2007)*.

Douglas County and the Carson Valley are closely tied with the Carson City area, and U.S. 395 is the main travel corridor connecting these two areas. It will be necessary to make improvements to this highway as new development creates additional trips. In addition, it may be necessary to construct grade-separated interchanges at specific locations.

- 4.2.12 Support possible bypass facilities to keep traffic moving through Minden and Gardnerville.

The U.S. 395/Main Street corridor is important to the vitality and the sense of community in Douglas County. As the largest towns in the county, Minden and Gardnerville have a strong desire to preserve their identity and character. Local residents developed the *Minden Plan for Prosperity (2003)* and the *Gardnerville Plan for Prosperity (2006)* along with *Design Guidelines* to address their most important issues. The plans made the following recommendations:

- Provide traffic signals at selected intersections to allow pedestrian crossings of U.S. 395.
- Provide medians and crosswalks to facilitate pedestrian and bicycle connections.
- Use traffic calming devices to slow traffic through towns for safe access to local businesses.
- Improve the image of U.S. 395 by creating walkable streetscapes.

Construct the following projects (if needed):

- In the north part of Minden, west of U.S. 395, near the intersection with SR 88, construct a connection from U.S. 395 to SR 88 which bypasses the existing Ironwood development and the Douglas High School.
- On SR 88, from the bypass of the Ironwood/Douglas High School area to Kimmerling Road and the extension of Dressler Lane from SR 88 to U.S. 395, increase capacity from two lanes to four lanes.
- In the south part of Carson Valley, south of Dresslerville, from U.S. 395 to SR 88, construct a two-lane collector generally running in an east-west direction as an extension of Dressler Lane.
- Other projects identified by NDOT to provide highway bypass facilities consistent with the guiding principles stated in this section.

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- 4.2.13 Develop a truck routes plan to keep excessive through traffic out of neighborhoods.

Current truck levels are not excessive in Douglas County; however, the county needs to plan for future growth in the area.

County Code Title 10 Vehicles and Traffic, Section 10.08 Control Devices has recently been updated to more clearly address truck traffic restrictions in Douglas County. Refer to 10.08.040 Vehicle restrictions on highways or streets, and 10.08.050 Vehicle restriction exceptions, both updated in 2016. Also refer to 10.08.020 Placement of traffic control devices in general improvement districts.

- 4.2.14 Resolve/prevent neighborhood traffic issues by providing adequate through traffic facilities on major collectors and arterials.

As the levels of traffic increase, there are more conflicts between vehicles and neighborhood residential uses. Arterial and collector streets should be designed to provide sufficient capacity to reduce through traffic on local streets. Traffic calming measures may be employed in a supporting role where required.

The fundamental challenge is to develop an adequate county-wide transportation network that will service traffic needs within the Minden/Gardnerville area and will provide adequate traffic capacity for movement to the Carson City area. Douglas County will continue to explore ways to provide north-south and east-west collectors and arterials, including providing additional capacity on Heybourne Road, Vicky Lane, Stephanie Way and Johnson Lane.

In 2025 with the existing roadway network (i.e., without construction of Muller Parkway), U.S. Highway 395 is anticipated to experience localized LOS failures in the downtown area and from SR 88 north to Muller Parkway. Completion of a two-lane Muller Parkway from Pinenut Road with a posted speed limit of 45 mph (the design speed) provides a very attractive alternative to U.S. 395 through the downtown area. These improvements result in acceptable LOS on U.S. 395 but LOS E and F on Muller Parkway from Toler Lane to Heybourne Road. Accordingly a 4-lane Muller is recommended for construction by 2025.

- 4.2.15 Provide traffic transitional facilities (such as traffic circles/roundabouts) in the Minden/Gardnerville area.

- 4.2.16 Maintain a current map of proposed Douglas County transportation improvement projects.

- 4.2.17 Maintain current design standards for Douglas County roadway classifications as identified in the *Douglas County Design Criteria and Improvement Standards Manual*.

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- 4.2.18 Maintain a level of service “C” or better on all Douglas County streets and roadways.

The *1996 Douglas County Master Plan* and the 2007 Transportation Plan stated that the minimum standard for the county road network is LOS C, which indicates stable-flowing traffic with acceptable delays. The 2014 and 2015 traffic counts and the travel demand model indicate that the current level of service is C or better on all County-maintained streets and highways in Douglas County. Constructing the capacity-increasing projects identified in Tables 4.7 and 4.8 will keep the traffic level of service from falling below LOS C on County-maintained roads.

- 4.2.19 Provide transitional facilities between higher and lower classes of roadway functional types.

As roadway facilities are improved or developed in Douglas County, transitions are needed between higher capacity, higher speed facilities and lower capacity, lower speed facilities. In Minden, for example, a transition is needed between the north–south alignment of U.S. 395, which is currently a four-lane divided highway functioning much like a freeway, and the northwest–southeast alignment of U.S. 395 through Minden and Gardnerville. Traffic signals may be installed as an interim traffic control device.

It could be beneficial to install a traffic circle/roundabout at the intersection of Muller Lane and U.S. 395 at some point in the future. These types of transitional facilities are more effective than traffic signals when used in areas where the traffic volumes are greater than what a traffic signal would typically accommodate. Traffic is able to move through this type of facility more quickly and with fewer accidents than a conventional signalized intersection, while also serving as a transition between higher and lower speed facilities.

4.3 Transportation Capital Improvement Projects

The existing transportation plan has guided infrastructure improvement since 2007. The *2016 Douglas County Transportation Plan* lists the street and highway projects needed to accommodate planned growth in Douglas County up to the year 2040. These projects are identified in Tables 4.7 and 4.8. These projects have been incorporated into the travel demand model to determine the phasing necessary to maintain LOS standards. The travel demand model indicates that by completing these projects, the travel network will be able to accommodate the estimated traffic volumes in 2025 and 2040 and maintain traffic level of service C on Douglas County roadways, and LOS D on NDOT roadways. The county can then adopt projects from Plan into the Douglas County 5-Year Transportation Plan.

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4.4 Near-Term Improvement Projects identified in the *U.S. 395 Southern Sierra Corridor Study (2007)*

System-wide transportation improvements are generally quite expensive, costing millions of dollars and often taking 10 to 20 years to complete. By contrast, near-term safety improvements can improve traffic safety and operations at a substantially lower cost and with a quicker implementation schedule. This report section contains projects that were listed in previous documents—the *U.S. 395 Southern Sierra Corridor Study (2007)* and the *2007 Douglas County Transportation Plan*.

Simultaneous with developing the *2007 Douglas County Transportation Plan*, Parsons prepared the *U.S. 395 Southern Sierra Corridor Study* for the NDOT. A significant part of the study was the 2007 public outreach effort, known as the traffic safety charrette, which generated numerous near-term safety recommendations for specific projects within the U.S. 395 corridor and at selected intersections. The corridor study recommended implementing these safety improvements within three to five years. NDOT representatives provided the cost and schedule estimates in 2006. The estimated project schedule is effective from the date of NDOT approval and funding.

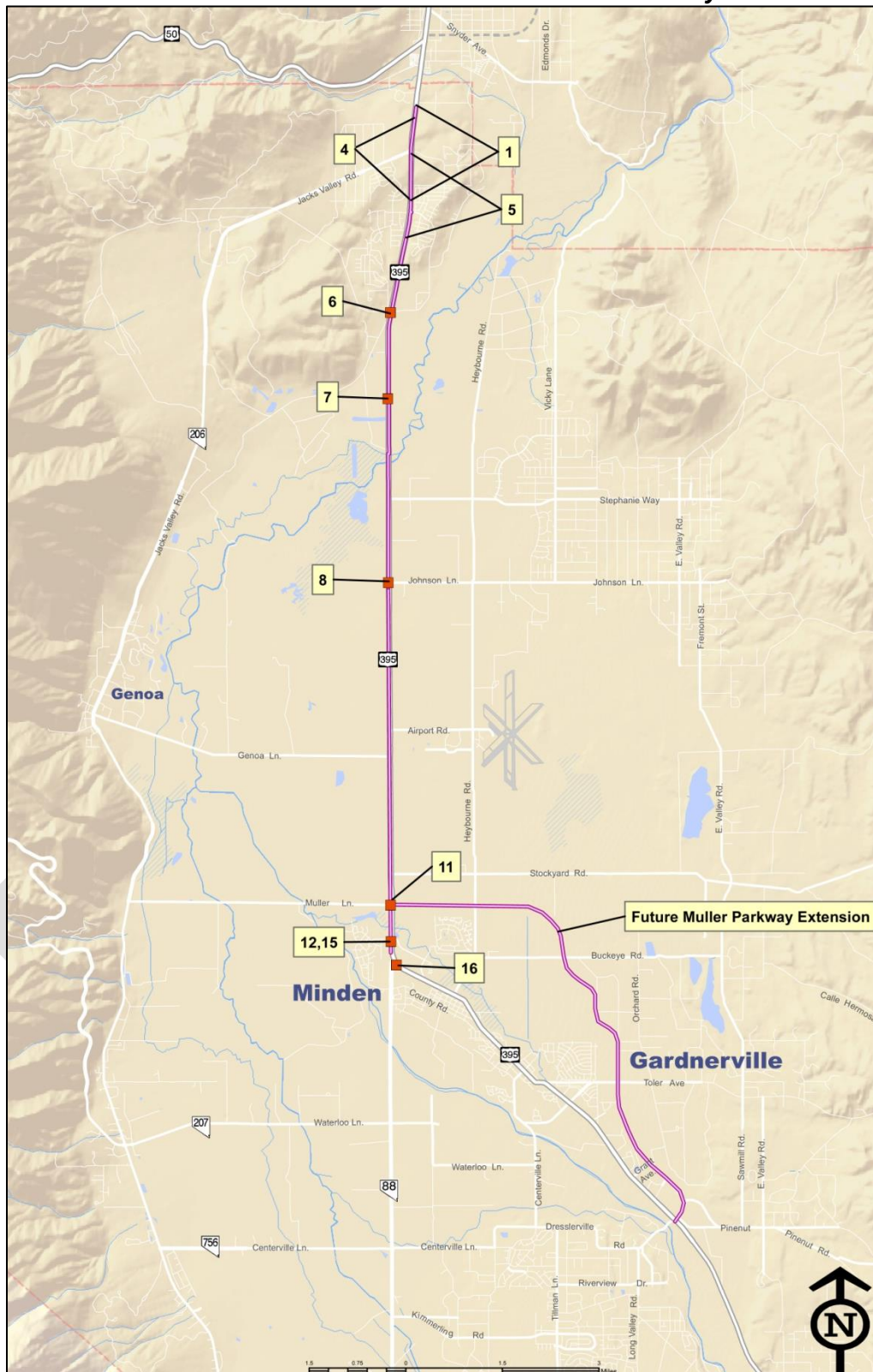
Table 4.6 summarizes the near term recommendations from 2007 that were identified in the corridor study that have not yet been implemented. Those are discussed in more detail below.

Table 4.6: Summary of U.S. 395 Safety Improvements Recommended as Near Term in the NDOT *U.S. 395 Southern Sierra Corridor Study*—2007, not yet implemented

PROJECT	LIMITS AND ACTIONS	SCHEDULE	COST ESTIMATE*
Corridor Improvements			
1. Widen roadway markings	Entire corridor	6 months	\$ 3,600
Acceleration/Deceleration Lanes			
2. Jacks Valley Road	Extend three lanes through intersection	18-36 months	\$480,000
3. Mica Drive	Add truck climbing lane to Sunridge Drive	18-36 months	\$720,000
4. South Sunridge Drive	Add northbound lanes	18-36 months	\$480,000
5. Silver City RV Resort	Add and lengthen lanes	18-36 months	\$570,000
6. Johnson Lane	Add lanes	18-36 months	\$780,000
Other Intersection Improvements			
7. Muller Lane	Install traffic signal	18-36 months	N/A
8. Ironwood Drive	Remove eastbound/westbound left-turns	18-36 months	N/A
Roundabouts			
9. Ironwood Drive	Construct roundabout	24-48 months	N/A
10. SR 88	Construct roundabout	24-48 months	N/A
Project Evaluations/Studies			
11. Roadway Access Management Study		6-18 months	\$ 20,000
12. Traffic Signal Installation and Coordination Study		18 months	\$420,000

* Cost estimate from 2007 *U.S. 395 Southern Sierra Corridor Study*, updated to 2016 dollars

Figure 4.3: Locations of U.S. 395 Safety Improvements Recommended as Near Term in the NDOT U.S. 395 Southern Sierra Corridor Study—2007



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4.4.1 ACCELERATION/DECELERATION LANES

High-speed traffic makes entering and exiting U.S. 395 a difficult task. Adding or extending acceleration/deceleration lanes at intersections and driveways would improve this situation.

Jacks Valley Road

Currently, the right travel lane on southbound U.S. 395 becomes a right-turn only lane at the intersection of Jacks Valley Road. The 2007 Corridor Study recommends continuation of this lane through the intersection, ending south of the shopping center driveway south of Jacks Valley Road. It may be feasible to complete this project when future development occurs.

Mica Drive

Northbound trucks must come to a complete stop for the traffic signal at Mica Drive/Sunridge Drive, and their slow start-up speeds cause traffic to back up. It was recommended in the 2007 report that Douglas County pursue a project with NDOT to construct a truck climbing lane from Mica Drive to Sunridge Drive. The lane would allow for a right-turn lane to serve the residential area access from Sunridge Drive. Cost is estimated at \$720,000 in 2016 dollars and implementation would take between 18 and 36 months from the time of NDOT approval and funding.

South Sunridge Drive

New home construction in this area has increased the number of vehicles turning into and out of this street. Currently, vehicles must enter the outside travel lane to travel northbound. Northbound traffic must reduce its speed within the northbound outside travel lane to make a right-turn onto South Sunridge Drive. The 2007 Corridor Study recommends that Douglas County pursue a project with NDOT to add northbound acceleration and deceleration lanes to serve this traffic. Cost is estimated at \$480,000 in 2016 dollars and the project would take between 18 and 36 months to complete from the time of NDOT approval and funding.

Silver City Recreational Vehicle Resort

Large recreational vehicles (RV) access a commercial site via a private driveway on U.S. 395 near South Sunridge Drive. Due to the size of the vehicles and the distance needed to decelerate for the approach or accelerate into traffic, longer deceleration and acceleration lanes are needed. Participants in the 2007 outreach effort recommended that Douglas County pursue a project with NDOT to lengthen the deceleration lane, add an acceleration lane, and lengthen the southbound left-turn lane into the RV park. The cost for the project is estimated at \$570,000 in 2016 dollars and the project would take between 18 and 36 months to complete from the time of NDOT approval and funding.

Johnson Lane

There is a need for an acceleration lane to facilitate traffic turning right from Johnson Lane onto U.S. 395. To widen U.S. 395 at this point, right-of-way is needed to relocate irrigation ditches and head gates. In addition, Johnson Lane should also be widened 14 feet to the north to allow for a right-turn lane. It was recommended in 2007 that Douglas County pursue a project with NDOT to make these changes, estimated to cost \$780,000 in 2016 dollars. It

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would take an estimated 18 to 36 months to complete the project from the time of NDOT approval and funding, not including right-of-way acquisition.

4.4.2 ACCESS MANAGEMENT

It is necessary to manage the points where traffic enters and exits U.S. 395, which could be accomplished by eliminating or consolidating openings and moving traffic to grade-separated interchanges or newly constructed parallel routes. An Access Management Assessment was recommended in 2007. This detailed study would determine the number of approaches with median openings that should be combined, modified or removed. The study could be completed by NDOT staff at a cost of about \$20,000 in 6 to 18 months from the time of NDOT approval and funding.

4.4.3 ALTERNATE ROUTES

Suggestions for frontage roads and connections within existing county road systems were expressed during the 2007 traffic safety charrette process. Some people advocated for a new freeway alignment, while others envisioned new routes for local traffic that would preserve U.S. 395 for regional traffic. Realizing that these new roadways are expensive and require a long time to complete, these projects are listed in Section 4.5 Needs Assessment for Future Development along with other mid-term or long-term projects.

4.4.4 PAVEMENT MARKINGS

The 2007 Corridor Study recommended that NDOT replace faded markings with 8-inch-wide lines to improve visibility. The faded pavement markings have been replaced with standard width (6-inch) lines, not the wider 8-inch lines.

4.4.5 ROUNDABOUTS

Roundabouts are circular intersections with channelized approaches. In a roundabout, entering traffic yields to circulating traffic. Speeds are controlled by the design, and generally range from 15 to 27 mph. Roundabouts can be single or multiple lanes. The primary benefit of roundabouts is improved safety. Single and multiple lane roundabouts have fewer crashes with less severe injuries than signalized intersections and provide greater traffic capacity. Roundabouts are aesthetically pleasing and are sometimes used to create a gateway, or entrance, to communities.

Muller Lane

The characteristics of the U.S. 395 corridor become more suburban south of Muller Lane. During the public outreach for the 2007 update members of the public expressed the need for a gateway, or entrance, into the Minden area that would alert motorists of the need to slow down, using signs or a traffic signal. In 2007 the consultant team suggested consideration of a

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roundabout at this site. In 2016 the Town of Minden constructed gateway improvements (landscaping) at the U.S. 395/SR88 intersection.

Ironwood Drive

The 2007 Corridor Study recommended eliminating the left turn from the Ironwood Center onto U.S. 395 to reduce conflicts at this intersection. NDOT should partner with Douglas County to work with affected parties to ensure access needs are met.

4.4.6 TRAFFIC SIGNAL INSTALLATION AND COORDINATION

The 2007 Corridor Study recommended a Traffic Signal Installation and Corridor Study for the U.S. 395 corridor. Signal coordination is the process of timing traffic signals along a corridor to allow multiple signals to operate together as a group. It provides a means by which the sequence of green lights is established along a series of traffic signals to provide a consistent flow of traffic through a corridor.

Figure 4.4 shows the locations of existing signalized intersections in the U.S. 395 corridor through Minden and Gardnerville, as well as locations for potential future roundabouts or traffic signals. The estimated cost for completing the signal coordination project is \$420,000. The project could be completed within 18 months of initiation.

4.4.7 IMPLEMENTATION OF NEAR-TERM IMPROVEMENTS

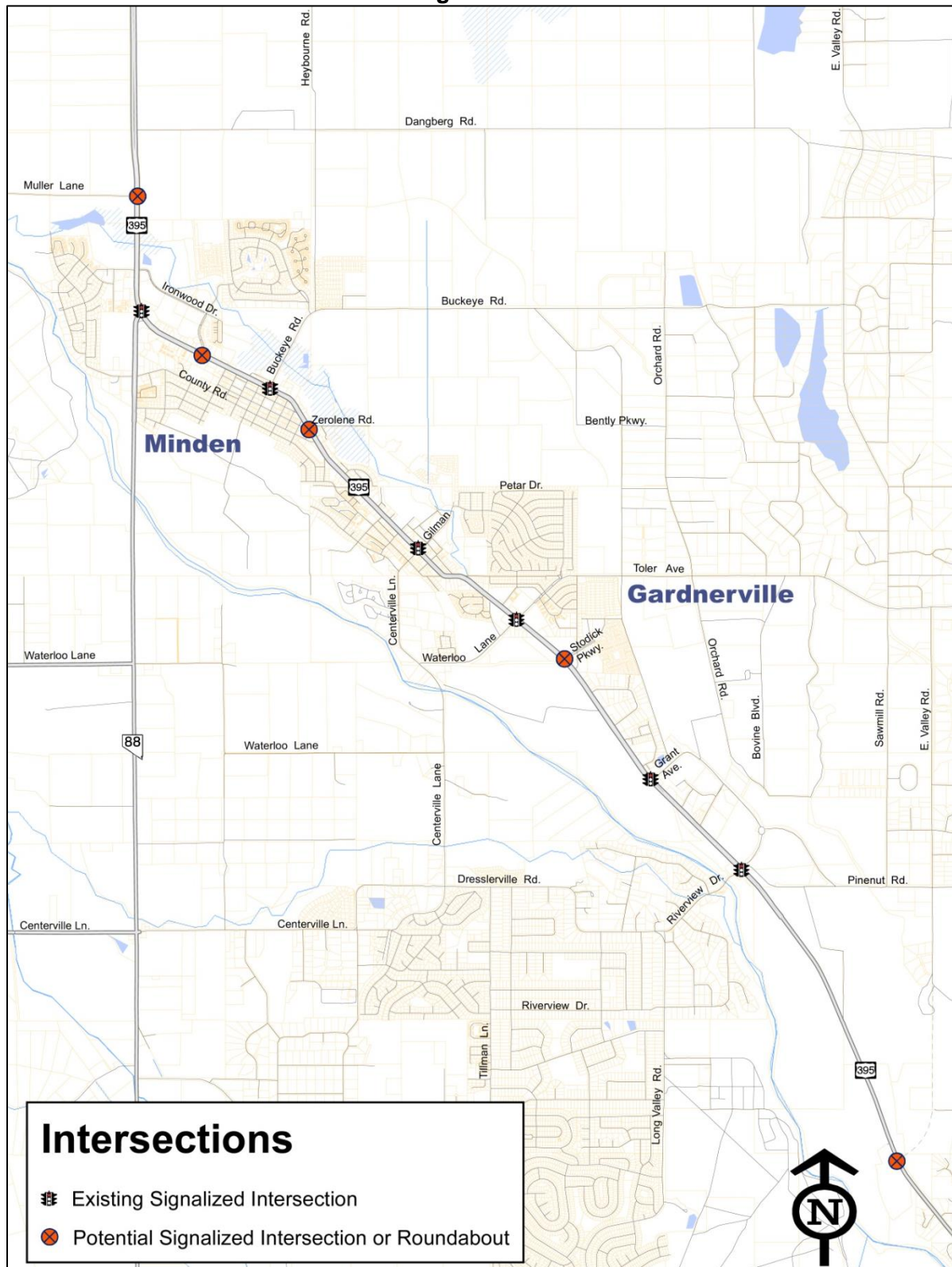
The 2007 Corridor Study public outreach effort resulted in numerous recommendations to improve safety on U.S. 395 between U.S. 50 and the Nevada/California state line over the next three to five years, most of which are located in Douglas County. Strategies for implementation are dependent on the type of process and available funding applicable to each recommendation.

According to NDOT procedures, Douglas County must submit an application for each individual project to NDOT. Once NDOT determines that the project application is complete, the project is ranked against other projects in the state. NDOT implements these projects as funding becomes available. Project steps include securing funding, working with Douglas County and property owners, and scheduling the work.

Some recommended improvements qualify for the NDOT Safety Improvement Program or as District II maintenance projects. Those include:

- Restripe shoulders and lanes with 8-inch wide markings
- Conduct access management assessment
- Eliminate left-turn lane at Ironwood Drive

Figure 4.4: Existing Traffic Signals and Potential Future Roundabouts or Traffic Signals in the U.S. 395 Corridor



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The projects listed below must go through a project development process as required by the Nevada Legislature.

- Install acceleration/deceleration lanes
- Install truck climbing lane from Mica Drive to Sunridge Drive
- Extend third lane past Jacks Valley Road
- Lengthen right-turn pocket on Johnson Lane

The following short-term improvement projects are taken from the *2007 Douglas County Transportation Plan* and remain current in this updated Plan.

4.4.8 INTERSECTIONS ALONG U.S. 395 IN THE TOWN OF MINDEN

The 2007 Corridor Study noted that, as redevelopment occurs on parcels adjacent to the intersections of U.S. 395 with Esmeralda Avenue and Mono Avenue in Minden, there will be opportunities to acquire right-of-way to realign the intersections as perpendicular intersections. If right-of-way can be acquired, Douglas County can design and construct these improvements, similar to the realignment of County Road at U.S. 395.

4.4.9 U.S. 395 IN THE TOWNS OF MINDEN AND GARDNERVILLE

Goal 2 of the County's Valley Vision Plan (2013) reads "*Address noise, air quality, congestion, and traffic safety issues by diverting large truck traffic out of downtown areas.*" Additionally, both the Gardnerville Plan for Prosperity (2006) and the Minden Plan for Prosperity (2003) speak to the issue of traffic on U.S. 395 in the downtown area. Section One of the Gardnerville Plan states "*The increasing dependence on U.S. 395 to carry local and regional traffic has a negative impact on Minden's and Gardnerville's main street appeal*" while Section Two indicates that the public wants traffic calming and improved pedestrian access along the highway through Town. Section Two of the Minden Plan indicates that access to downtown, by cars and pedestrians, is enhanced by providing parking and pedestrian improvements, and Section Three includes an action item for downtown streetscaping.

Recent (2015) counts provided by the Nevada Department of Transportation show an average of 669 heavy (semi and multiple trailer) trucks per day travelling through the downtown area. This is approximately three percent of the total traffic volume.

Diverting trucks from downtown requires the establishment of a route around the downtown area that is available to trucks and convenient for their use. One such route could be Waterloo Lane Extension from U.S. 395/Stodick Parkway due west to SR 88, with designation as an "express route" for trucks and cars. This improvement would also provide a much-needed east/west route for trucking of construction materials. Although it would reduce overall downtown traffic somewhat, it would not eliminate the need for Muller Parkway to reduce congestion on U.S. 395 through Minden and Gardnerville.

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The Town of Gardnerville supports the construction of Muller Parkway as a means of removing trucks from downtown. In fact, the Town's Strategic Plan contains the action item *"Work with other agencies to make Muller Parkway a truck bypass. After bypass is complete work to create a center median on Main Street to beautify the downtown."* However, this is in direct opposition to action previously taken by the Board of Commissioners. On January 6, 2005 the Board approved the current Muller Parkway alignment with the understanding that heavy trucks would be prohibited from the roadway except for local deliveries. The action taken by the Board is recorded in the minutes of the meeting as, "MOTION by Kite/Smith to approve the report as it was sent to the Planning Commission and to confirm the previous adoption of the resolution with the addition of language it is not to be a truck route and with the understanding that local deliveries would be acceptable; carried with Commissioner Johnson voting Nay and Commissioner Etchegoyhen abstaining."

When evaluating these two potential options for removal of trucks from the downtown area, the pros and cons of each project should be considered. The Waterloo Extension from SR 756 (Centerville Road) to SR 88 would provide a truck route around the downtown area, but this project would have no appreciable impact on LOS on U.S. 395 through the towns, or elsewhere. It would serve only this one purpose. Muller Parkway, on the other hand, is needed regardless of whether or not Waterloo Lane Extension is constructed. It is needed to address future LOS deficiencies at a number of locations, including U.S. 395 through town, U.S. 395 north of the SR 88 intersection, and on Buckeye Road. Should the Board desire to reverse its 2005 action designating Muller Parkway as "not a truck route" (local deliveries allowed), Parsons recommends that the County solicit input from the public on this issue prior to making its decision.

Traffic congestion in the downtown area could also be improved by providing alternative modes of transportation, and by enhancing existing services. DART, BlueGo and the Carson Valley Airporter currently operate in the downtown area and beyond. The County could consider expanding the DART service to provide reduced headways (i.e., more frequent pickup and drop-off times.) Trolleys, either on-street with rubber tires or operating on fixed rails, could provide alternatives to travel by automobile while enhancing the experience of visitors and residents alike. (Detailed maps showing potential future alignments for the V&T Railroad in the downtown area are included in Appendix B.) Landscape, sidewalk and lighting improvements would improve walkability and encourage more pedestrian activity downtown. Finally, a traffic signal study that evaluates signal timing and the potential for traffic signal coordination should be considered for U.S. 395 corridor from Riverview Drive to SR 88.

As redevelopment occurs on parcels adjacent to U.S. 395 in Minden and in Gardnerville, site plans should be reviewed to identify opportunities to consolidate and organize driveway access locations. Implementation of these driveway modifications will improve safety and traffic flow within the corridor.

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4.4.10 STATE ROUTE 88 INTERSECTIONS

Douglas County will continue to coordinate with NDOT to monitor traffic volumes and intersection delays at critical locations (County Road, Waterloo Lane, Centerville Road, Kimmerling Road). If localized intersection improvements are warranted, Douglas County will coordinate with NDOT to implement intersection improvements.

4.5 Needs Assessment for Future Development

Recent development approvals indicate the potential for substantial new residential development in the next 10 to 15 years. (Refer to Table 2.5, Tentatively Approved Residential Subdivisions, and Table 2.6, Approved Specific Plans.) The additional trips created by new development in both Douglas County and Carson City will add to existing traffic volumes, causing some County roadway segments to fall below LOS C, and some additional NDOT segments to fall below LOS D unless new transportation projects are constructed.

While land developers construct local transportation improvements in the vicinity of their projects, local growth has a regional impact on the transportation network. These regional impacts will not be mitigated by the current inventory of local roadway improvements. Therefore, a primary objective of the *2016 Douglas County Transportation Plan* is to identify regional infrastructure improvements that will preserve a high quality-of-life for Douglas County's current and future generations of residents as development continues.

If residential and commercial development continues at the Historic Growth Rate of 1.39 percent through 2025 and no capacity increasing projects are implemented, the traffic level of service on roadway segments in Douglas County will fall below acceptable LOS standards as shown below. Projects are listed in decreasing order of LOS failure, worst first.

Table 4.7 2025 LOS Deficiencies with Existing Road Network (no projects)

ROAD SEGMENT	ALLOWABLE LOS	ANTICIPATED LOS
U.S. 395 from U.S. 50 to Mica Drive	D	F
U.S. 395 from Muller Lane to Ironwood Drive	D	F
U.S. 395 from Mica Drive to Stephanie Way	D	E
U.S. 395 from Ironwood Drive to SR 88	D	E
U.S. 395 from Cemetery Lane to Gilman Road	D	D/E
Stephanie Way from U.S. 395 to Heybourne Road	C	D
Riverview Drive from Dresslerville Road to U.S. 395	C	C/D

As the current population of Douglas County grows to the projected population of 70,376 in 2040, and if no capacity increasing projects during that time, the number and magnitude of the deficiencies will continue to grow. The following table shows the anticipated deficiencies in 2040 with the existing road network plus completion of Heybourne Road from Buckeye Road to Meridian Boulevard.

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**Table 4.8 2040 LOS Deficiencies with Existing Roadway Network plus
Mid-term Project #5 Heybourne Road**

ROAD SEGMENT	ALLOWABLE LOS	ANTICIPATED LOS
U.S. 395 from U.S. 50 to Stephanie Way	D	F
U.S. 395 from Muller Lane to Ironwood Drive	D	F
Riverview Drive from Dresslerville Road to U.S. 395	C	E/F
U.S. 395 from Ironwood Drive to SR 88	D	E
Buckeye Road from U.S. 395 to Heybourne Road	C	E
SR 756 (Centerville Lane) from S. Waterloo Lane to N. Waterloo Lane	D	E
U.S. 395 from Cemetery Lane to Toler Lane	D	D/E
Stephanie Way from U.S. 395 to Heybourne Road	C	D
Buckeye Road from Heybourne Road to Sanford Street	C	D
Heybourne Road from Buckeye Road to Stockyard Road	C	D
Dresslerville Road from Riverview Drive to Long Valley Road	C	C/D

Table 4.9 lists the mid-term, Phase 1 projects needed to maintain LOS C on roads maintained by Douglas County and LOS D on roads maintained by the Nevada Department of Transportation through 2025. The projects are listed in order of importance, most important first, as determined by the severity of the LOS deficiency that each project addresses. For example, the first four projects in table 4.9 are needed to address the worst anticipated 2025 deficiencies (LOS F) in table 4.7. The last project in table 4.9 addresses the least (and last) of the deficiencies identified in table 4.7.

Table 4.10 lists the Long-term, Phase 2 projects planned for Douglas County by 2040, needed to maintain LOS C on roads maintained by Douglas County and LOS D on roads maintained by the Nevada Department of Transportation through 2040.

Table 4.11 lists projects identified to provide alternate local and regional access that are not needed to maintain LOS standards within the 2040 planning horizon. Many of these projects were identified in the 2007 Plan as being needed to maintain LOS standards. However, the updated growth rate of 1.39 percent generates lower populations and lower traffic volumes compared to the 2.0 percent growth rate utilized in the 2007 Transportation Plan. As a result, many of the projects that were identified in the 2007 Transportation Plan are not needed to maintain LOS standards in this updated plan within the 2040 planning horizon.

Three of the projects in Table 4.11 were identified in the public input process for the 2007 Plan and were not deemed necessary to maintain LOS standards. Those are the Vicky Lane Extension to the Carson Freeway, the Heybourne Road Extension to the Carson Freeway, and the Carson Valley Eastside Bypass to the Carson Freeway. Figure 4.5 maps the locations of all of the projects listed in tables 4.9, 4.10 and 4.11.

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The *2016 Douglas County Transportation Plan* uses 2040 as the horizon year for planning purposes. As Douglas County continues to grow beyond that date, new transportation facilities will need to be planned and developed to accommodate future growth.

Many of the transportation projects identified on Figure 4.5 involve establishment of alignments for new roads. The alignments shown for these projects are conceptual. floodplains, steep topography, land ownership and restrictions on land use can impact projects costs, and all of these should be considered when establishing final alignments associated with new road construction. Current FEMA floodplain information can be found on the FEMA website at <https://msc.fema.gov/portal/search>. Figure 4.6 shows the topography of the Carson Valley. Figure 4.7 shows land ownership by State and Federal agencies, as well as Native American owned lands and land that is subject to conservation restrictions.

**Table 4.9: Proposed Transportation Projects—2016 to 2025 (Mid-term, Phase 1)
Needed to Maintain LOS C on Douglas County Roadways and LOS D on
NDOT Roadways**

ID #	ROAD	SEGMENT	IMPROVEMENTS	ESTIMATED COST**
1	U.S. 395	I-580/US50 to Jacks Valley Road	Segment 1 freeway improvements identified in the <i>U.S. 395 Southern Sierra Corridor Study</i> (U.S. 395 SSCS)*; overpasses at Old Clear Creek Road and Topsy Lane; interchange at Jacks Valley Road; frontage roads on both sides of freeway	\$256,600,000
2	U.S. 395	Jacks Valley Road to South Sunridge/Plymouth Drive	Segment 2 freeway improvements identified in the <i>U.S. 395 SSCS</i> *; overpass at Mica Drive; interchange at South Sunridge/Plymouth Drive; frontage roads on both sides of freeway	\$ 73,900,000
3	Muller Parkway	Monte Vista Avenue to Pinenut Road	Construct new 4-lane collector	\$ 39,400,000
4	Heybourne Road	Monterra Drive to Meridian Boulevard	Construct new 2-lane collector	\$ 25,400,000
5	U.S. 395	South Sunridge/Plymouth Drive to Johnson Lane	Segment 3 freeway improvements identified in the <i>U.S. 395 SSCS</i> *; overpass at Stephanie Way; interchange at Johnson Lane; frontage roads on both sides	\$ 87,400,000
6	Stephanie Way	U.S. 395 to S. Santa Barbara Drive	Widen existing road from 2 lanes to 4 lanes	\$ 11,200,000
7	Riverview Drive	Dresslerville Road to U.S. 395	Widen existing road from 2 lanes to 4 lanes	\$ 10,000,000
Total				\$503,800,000

* *U.S. 395 Southern Sierra Corridor Study*, 2007 (NDOT)

** Estimated costs are based on the *U.S. 395 SSCS* (2007) costs, adjusted for inflation using CPI data (average 2%/year)

2016 Douglas County Transportation Plan

**Table 4.10: Proposed Transportation Projects—2026 to 2040 (Long-term, Phase 2)
Needed to Maintain LOS C on Douglas County Roadways and LOS D on
NDOT Roadways**

ID #	ROAD	SEGMENT	IMPROVEMENTS	ESTIMATED COST**
8	U.S. 395	Jacks Valley Road to Mica Drive	Widen freeway to 6 lanes to match the 6 lanes north of Jacks Valley Road	\$ 6,000,000
9	U.S. 395	Johnson Lane to Muller Parkway	Segment 4 freeway improvements identified in the U.S. 395 SSCS*; interchanges at Airport Road/Genoa Lane; interchange or roundabout at Muller Parkway	\$147,300,000
10	Genoa Lane	West of U.S. 395	Realign Genoa Lane to meet Airport Road to facilitate a single interchange for both roads	\$ 4,000,000
11	U.S. 395	Muller Parkway to SR 88	Segment 5 improvements identified in the U.S. 395 SSCS*; widen U.S. 395 from 4 lanes to 6 lanes	\$ 12,400,000
12	U.S. 395	Riverview Drive/Muller Parkway to Rockbottom Road	Segment 7 improvements identified in the U.S. 395 SSCS*; widen from 2 lanes to 4 lanes with a continuous center left turn lane	\$ 34,800,000
13	Heybourne Road	Buckeye Road south to Gilman Avenue	Construct new 2-lane collector	\$ 14,500,000
14	Heybourne Road	Gilman Avenue east to Muller Parkway	Construct new 2-lane collector	\$ 11,500,000
15	Dresslerville Road	Riverview Drive to Long Valley Road	Widen from 2 lanes to 4 lanes	\$ 7,400,000
Total Project Cost				\$238,000,000

* U.S. 395 Southern Sierra Corridor Study, 2007 (NDOT)

** Estimated costs are based on the U.S. 395 SSCS (2007) costs, adjusted for inflation using CPI data (average 2%/year)

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**Table 4.11: Proposed Douglas County Transportation Projects—2016 to 2040
Projects for Alternate Local and Regional Access, Not Needed to
Maintain LOS Standards**

ID #	ROAD	SEGMENT	IMPROVEMENTS	ESTIMATED COST**
16	Vista Grande Extension	Jacks Valley Road to Topsy Lane	Construct new 2-lane collector	\$ 3,600,000
17	North Valley Road	Topsy Lane to North Sunridge Drive	Construct new 2-lane road	\$ 7,300,000
18	Waterloo Lane Extension	U.S. 395/Stodick Parkway to SR 88	Construct new 2-lane collector	\$ 28,200,000
19	Heybourne Road	Stephanie Way to Johnson Lane	Construct new 2-lane collector	\$ 7,200,000
20	Ironwood Drive Extension	Lucerne Street to Heybourne Road	Construct new 2-lane collector	\$ 5,000,000
21	Zerolene Road	U.S. 395 to Heybourne Road	Construct new 2-lane collector	\$ 4,600,000
22	East Valley Road Connection	Fremont Street to Vicky Lane	Construct new 2-lane collector	\$ 19,000,000
23	High School Street	Gilman Avenue to Courthouse Street	Construct new 2-lane local road	\$ 3,000,000
24	Sawmill Road	Toler Lane to Aervoe Pacific	Construct new 2-lane collector	\$ 6,500,000
25	Drayton Boulevard	Pleasantview Drive to Kimmerling Road	Construct new 2-lane collector	\$ 8,100,000
26	Sawmill Road Extension	Pinenut Road south to Eastside Bypass/U.S.395	Construct new 2-lane collector	\$ 10,000,000
27	East Ranchos Connection	U.S. 395 to Long Valley Road	Construct new 2-lane collector	\$ 17,900,000
28	South Ranchos Connection	E. Ranchos Connection to Dressler Lane Connection	Construct new 2-lane collector	\$ 7,900,000
29	U.S. 395***	Rockbottom Road to Double Springs	Segment 8 improvements identified in the U.S. 395 SSCS*; extend southbound truck climbing lane 10 miles	\$ 10,200,000
30	U.S. 395 Westside Bypass	Genoa Lane to Mottsville Lane	Segment 9 improvements identified in the U.S. 395 SSCS*; Construct new 4-lane bypass	\$ 47,200,000
31	SR 88	U.S. 395 to Kimmerling Road	Segment 10 improvements identified in the U.S. 395 SSCS*; widen from 2 lanes to 4 lanes	\$ 30,000,000
32	Dressler Lane Connection	U.S. 395 to SR88/Fairview Lane	Segment 11 improvements identified in the U.S. 395 SSCS; Construct new 2-lane collector	\$ 48,600,000
33	U.S. 395 Carson Valley Eastside Bypass	U.S. 395 to I-580 Freeway	Segment 12 improvements identified in the U.S. 395 SSCS*; Construct new 2-lane arterial	\$320,000,000
34	Vicky Lane Extension	Vicky Lane to I-580 Freeway	Construct new 2-lane collector	\$116,800,000
35	Heybourne Extension	Stephanie Way to I-580 Freeway	Construct new 2-lane collector	\$113,500,000
			Total	\$814,500,000

* U.S. 395 Southern Sierra Corridor Study, 2007 (NDOT)

** Estimated costs are from the U.S. 395 SSCS (2007) costs, adjusted for inflation using CPI data (average 2%/year)

*** This project identified in the U.S. 395 SSCS was not included in the 2007 Douglas County Transportation Plan

Figure 4.5: Map of Proposed Douglas County Transportation Projects—2016 to 2040

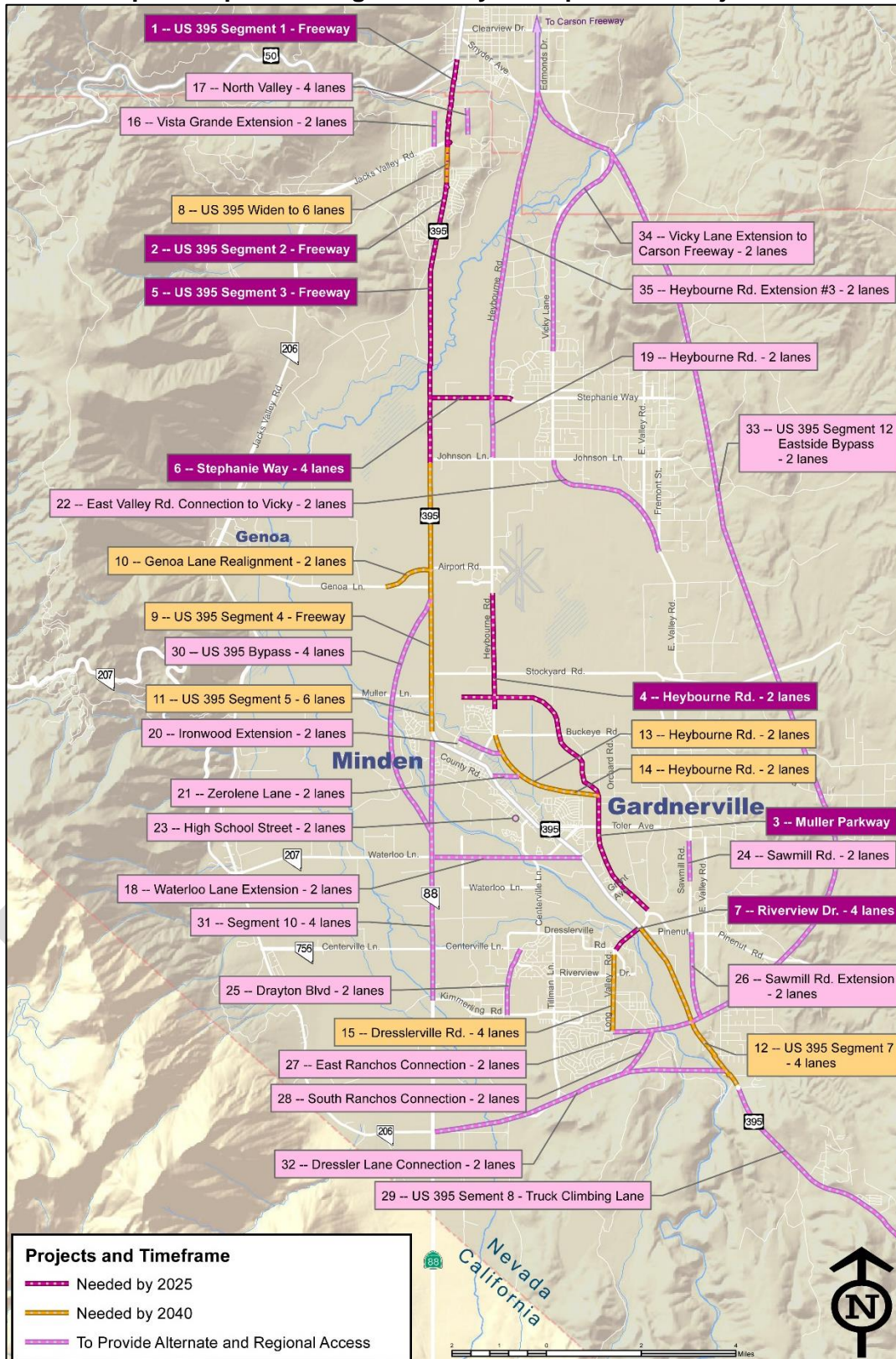


Figure 4.6: Topographic Map of the Carson Valley

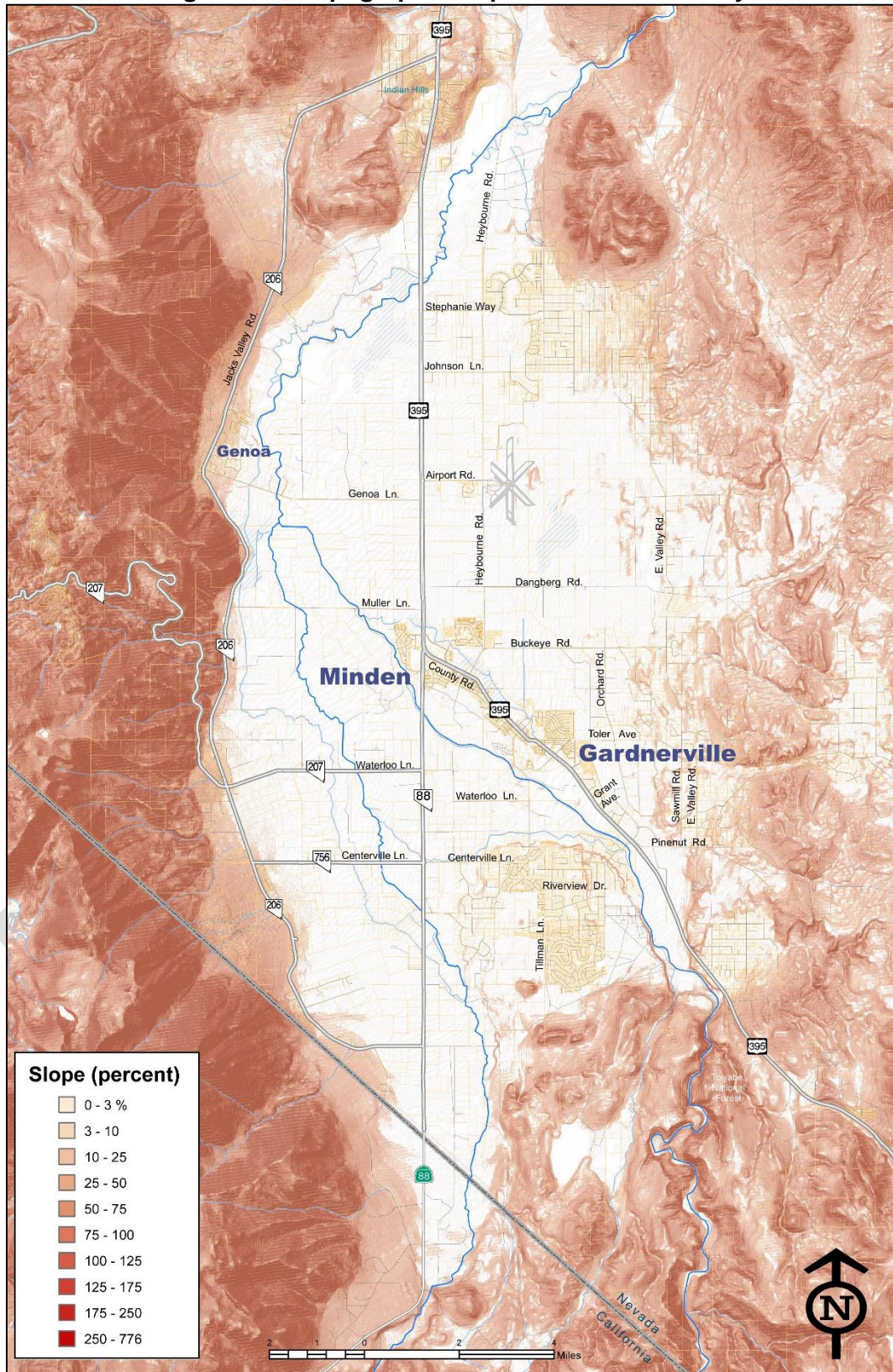
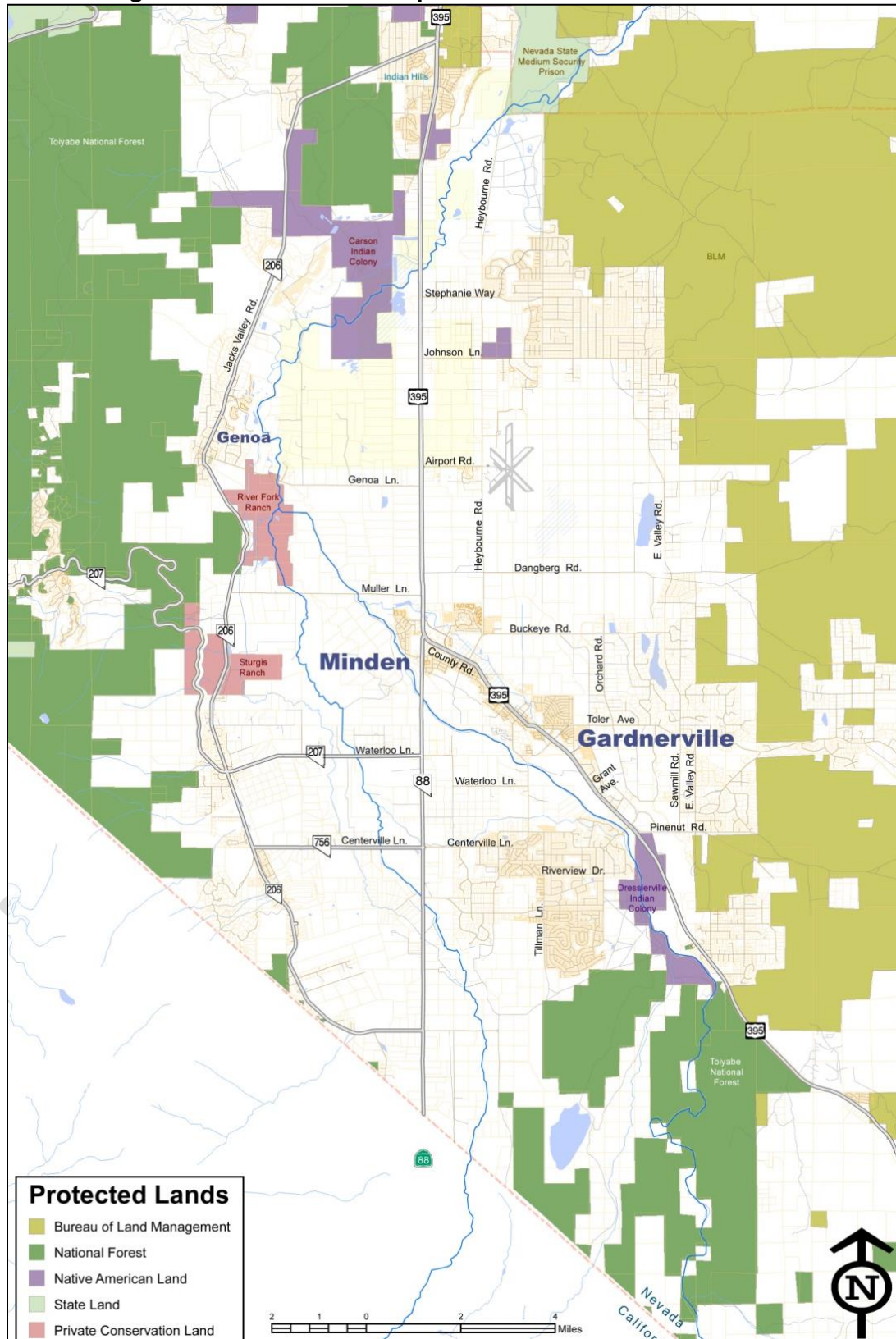


Figure 4.7: Land Ownership and Private Conservation Areas



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4.6 Douglas County Street and Highway Design Standards

Each of the roadway functional classifications has different characteristics. Design standards vary with each functional classification relative to the character of the service that they provide. Roadways should be designed in accordance with the following referenced guidelines.

Nevada Department of Transportation Jurisdictional Roadways

Road Division Design, Design Manual, Parts 1 and 2, latest edition, Nevada Department of Transportation.

Douglas County Jurisdictional Roadways

Please refer to the *Douglas County Design Criteria and Improvement Standards Manual* for project standards.

Typical roadway sections and associated rights-of-way are contained in the current version of the *Douglas County Design Criteria and Improvement Standards Manual*. The right-of-way requirements were established to accommodate the roadway and local street drainage only. Additional right-of-way to accommodate drainage facilities for other than local street drainage (off-site) may be required. Additional easements/right-of-way may be required for slopes and construction.

4.7 Emergency Access Routes and Flooding

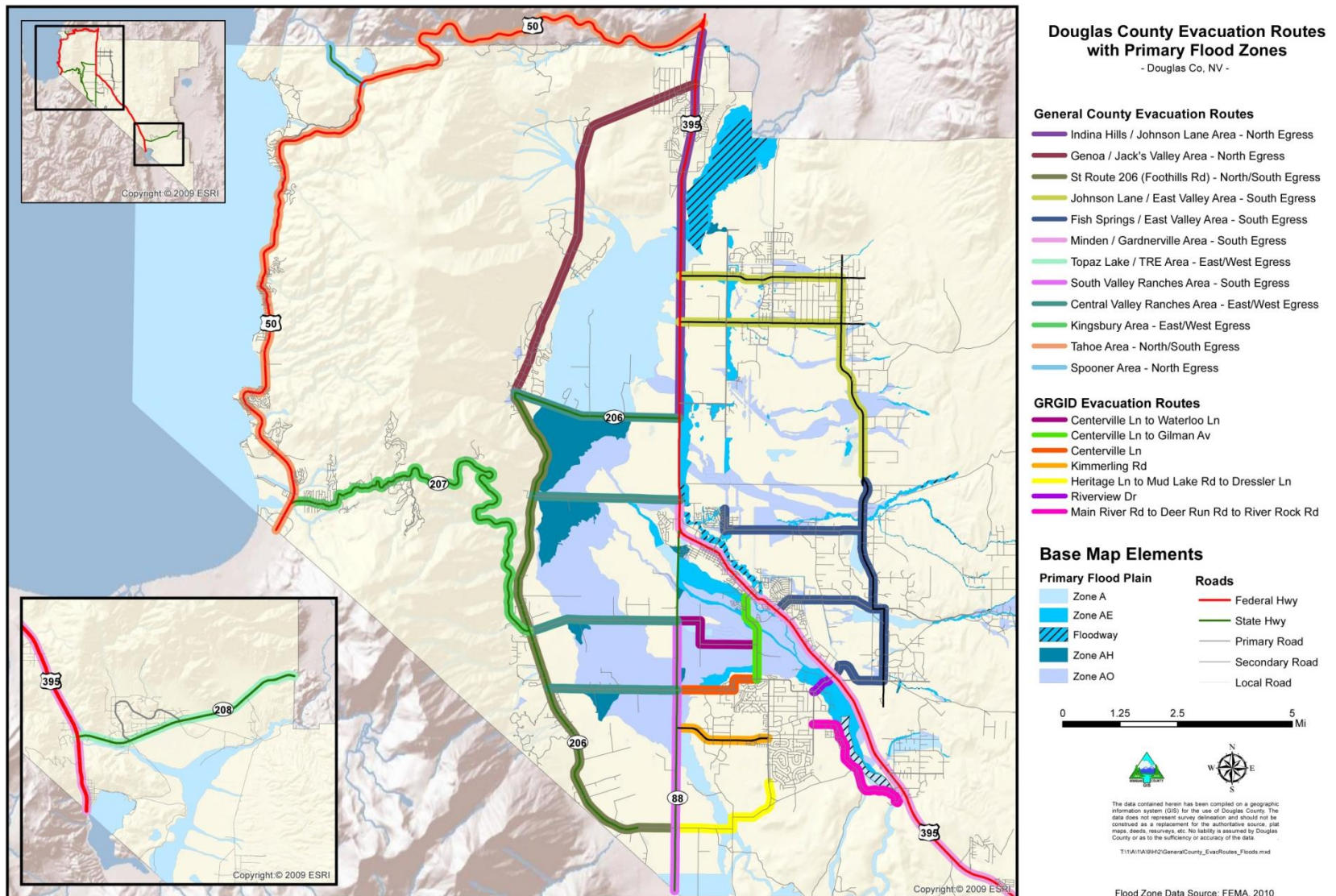
Although much of Douglas County is a high desert, flood events are not uncommon. Summer thunderstorms frequently generate localized flood events, and winter rains on snowpack can generate regional flooding. Figure 4.8, Douglas County Evacuation Routes, was prepared by the East Fork Fire and Paramedic District and Douglas County GIS office.

4.8 Complete Streets

Complete streets refers to retrofitting roads that are under the jurisdiction of a County Commission or Regional Transportation Commission to add or repair facilities that provide safe access for all users including pedestrians, bicyclists, persons with a disability, persons who use public transportation and motorists. The term includes the operation of a public transit system but does not include the purchase of vehicles or other hardware for operation of a public transit system.

Designing complete streets can increase the overall capacity of the transportation network by encouraging more transportation modes than just private automobiles. They also encourage exercise in the forms of walking and cycling, and can reduce vehicle emissions, improve safety and promote economic development. Adopting a Complete Streets Policy means routinely designing to provide safe access for all users of all ages and abilities, regardless of mode of travel.

Figure 4.8 Map of Douglas County Evacuation Routes with Primary Flood Zones





2016 Douglas County Transportation Plan

In 2013 the Nevada State Legislature approved legislation that provides funding for Complete Streets programs through the Nevada Department of Motor Vehicles. During the vehicle registration process, citizens have the option to make a voluntary donation to the Complete Streets Program. These funds are then set aside for use in the county in which they were collected. Under the legislation, a county may adopt a policy for a “Complete Streets Program” and may plan and carry out projects related to the program.

The Douglas County Regional Transportation Commission approved a Complete Streets Policy Statement on January 19, 2016 and is currently collecting funds from the program.

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Chapter 5 PUBLIC TRANSPORTATION ELEMENT

Public transportation is an important part of the overall transportation system, providing mobility to residents who do not have access to private vehicle usage, such as people with low incomes, the elderly and persons with disabilities. Public transportation also has the potential to reduce traffic congestion and vehicle emissions, depending on the number of people using the system. In addition to providing mobility within Douglas County, public transit allows residents to access regional employment, education and health care services located in the Carson City and Reno/Sparks area.

Douglas County is primarily a rural county, with a small, urbanized area surrounding Minden and Gardnerville. Because of Douglas County's dispersed pattern of development, transit must be carefully designed to serve the county's population at a reasonable cost. Lifeline transit services, such as the ones connecting Topaz Lake with north Douglas County and Kingsbury Grade to Lake Tahoe, allow Douglas County residents and visitors to reach essential services and activities with reasonable frequency.

5.1 Existing Public Transportation Services

5.1.1 DOUGLAS AREA RURAL TRANSIT (DART) DIAL-A-RIDE

Douglas County operates the Douglas Area Rural Transit (DART) Dial-A-Ride service, which carries passengers between the southern-most and northern-most points of the county along the U.S. 395 corridor. Most of this service occurs in the rural portions of Douglas County, allowing for use of funding from the Federal Transit Administration's Rural Transit Assistance Program.

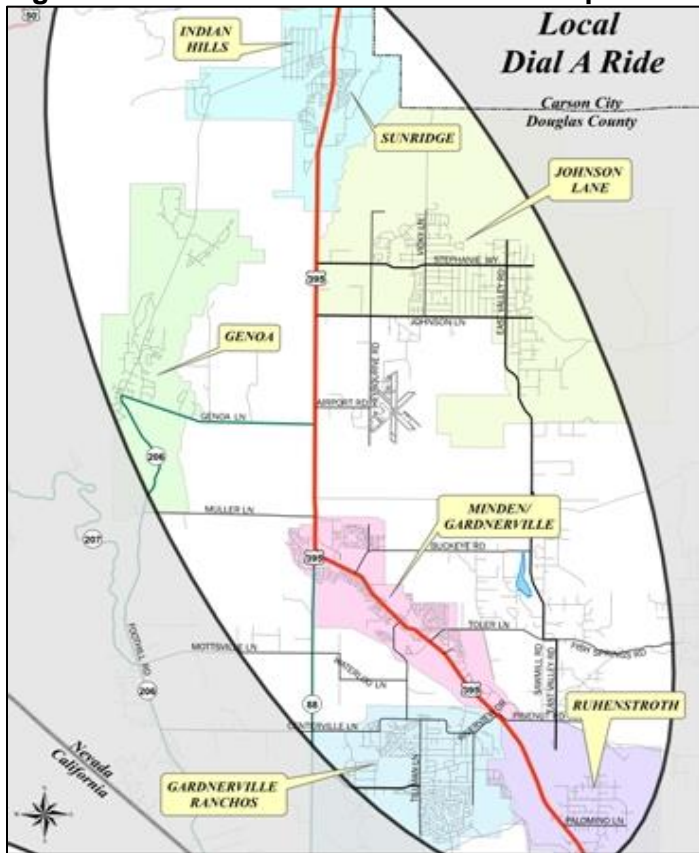
The Dial-A-Ride service extends from the Topaz Ranch Estates Community Center (near Topaz Lake) in the south to the Indian Hills community in the north. The Dial-A-Ride provides door-to-door service to seniors age 60 and over and disabled persons for shopping, medical appointments, recreation, Senior Center visitation and more. Rides must be scheduled in advance.

DART is funded with a one percent room tax on transient occupancy, Federal Transit Administration funds and the Douglas County General Fund. The cost for fiscal year 2014–2015 is \$493,378.



DART driver Renée D'Accardo proudly displays her vehicle

Figure 5.1: DART Service in Effect as of April 2016



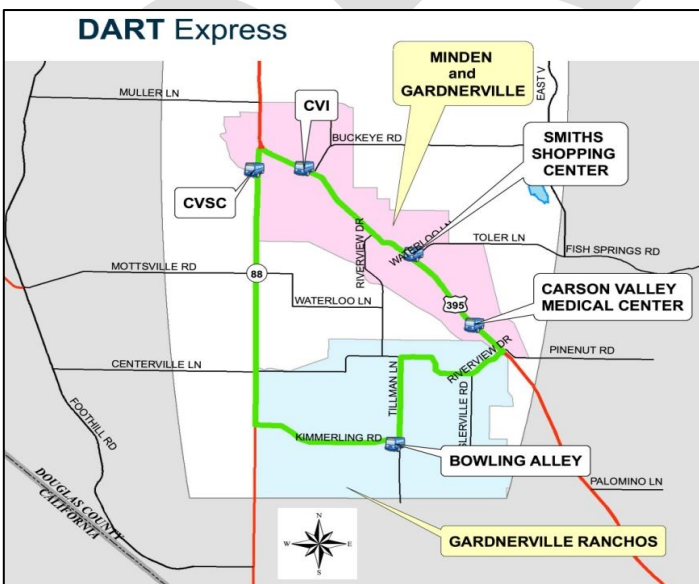
Source: Douglas County, Nevada, www.douglascountynv.gov/
Note: Best quality map available at the time of publication.

For the period from July 2014 through June 2015, DART public transportation provided 33,755 passenger trips (an average of 2,813 trips per month). Vehicle revenue miles totaled 169,381. Vehicle revenue hours totaled 13,800, operating 13 hours per day for the entire year. Douglas County collected \$11,500 in passenger fares during this time period.

5.1.2 DART EXPRESS

DART Express is a public fixed route that transports passengers to Minden, Gardnerville and the Gardnerville Ranchos. Specific transfer points are built into the route, to be shared with the Tahoe Transportation District for passengers seeking to ride north to Carson City (19X Express Route) or to South Lake Tahoe and Stateline ski areas (20X Lake Express Route). Once in Carson City, passengers can take Washoe RTC intercity regional transit service to Reno and Sparks.

Figure 5.2: DART Express Route Map



Source: Douglas County, Nevada, www.douglascountynv.gov/

For visitors and residents of Douglas County, the DART Express offers transportation to points of interest such as Tillman Center, the Carson Valley Medical Center, shopping centers located in Gardnerville (Smith's, Raley's, and Grocery Outlet), Herbig Park, Lampe Park, the senior center, the Carson Valley Inn, the library and Carson Valley Swim Center.

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Table 5.1: DART Express Schedule

Northbound – DART EXPRESS									
	TILMAN CENTER (Bowling Alley)	CARSON VALLEY MEDICAL CENTER	WALMART	COMMUNITY/ SENIOR CENTER	SHOPPING CENTER (Smiths)	CARSON VALLEY INN	LIBRARY	CARSON VALLEY SWIM CENTER	IRONWOOD CENTER
Route # 1	7:10 am	7:20 am	7:25 am	7:35 am	7:40 am	7:45 am	—	8:00 am	8:05 am
Route # 3	11:00 am	11:10 am	11:15 am	11:25 am	11:30 am	11:45 am	11:50 am	11:55 am	12:00 pm
Route # 5	4:00 pm	4:10 pm	4:15 pm	4:25 pm	4:30 pm	4:40 pm	4:45 pm	4:50 pm	4:55 pm
Southbound – DART Express									
	IRONWOOD CENTER	CARSON VALLEY SWIM CENTER	LIBRARY	CARSON VALLEY INN	SHOPPING CENTER (Smiths)	COMMUNITY/ SENIOR CENTER	WALMART	CARSON VALLEY MEDICAL CENTER	TILMAN CENTER (Bowling Alley)
Route # 2	8:05 am	8:10 am	—	8:15 am	8:30 am	8:35 am	8:45 am	8:50 am	9:00 am
Route # 4	2:35 pm	2:40 pm	2:45 pm	2:55 pm	3:10 pm	3:20 pm	3:30 pm	3:35 pm	4:00 pm
Route #6	4:55 pm	5:00 pm	5:05 pm	5:15 pm	5:20 pm	On Call	5:30 pm	5:35 pm	5:45 pm

5.1.3 BlueGo TRANSIT SERVICE

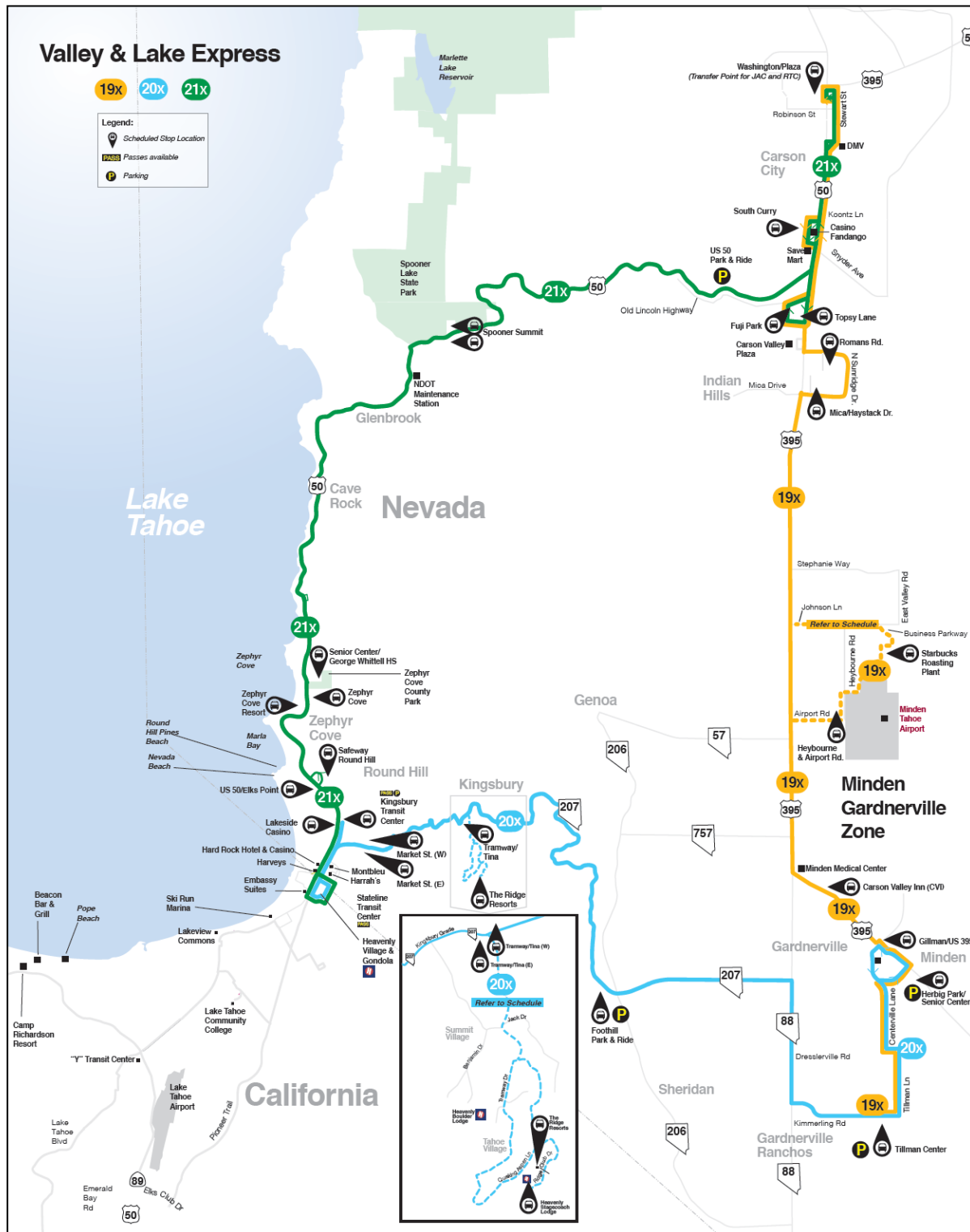
Transit service in Douglas County is connected to the Lake Tahoe area through the Tahoe Transportation District (<http://www.tahoetransportation.org/>). A new, expanded BlueGo (<http://www.BlueGo.org>) bus service that connects South Shore to Carson Valley goes on to Carson City.

Fares are \$4.00 for intercity trips and \$2.00 within local areas with half-price fares offered to youth, seniors and those with disabilities. Transfer stations are located at Tillman and Kimmerling in Gardnerville, and in Carson City at Washington and Plaza Streets.

To meet growing public demand for public transit, the agencies have simplified the fare structure, allowing transportation managers to hold the line on bus fares without major price increases. In the current fare structure, BlueGo will continue its \$3.00 on-call plan for seniors and the disabled. This on-call fare is available to persons aged 60 or older, Medicare or Medicaid card-holders, or those with a valid special needs or ADA credential. For all others, the cost for on-call service is \$10.00.

See Figure 5.3 for a map of the Valley and Lake Express routes, and Table 5.2 for the fixed-route schedule for the Nevada Route.

Figure 5.3: BlueGo Transit Map of Routes that Serve Douglas County and the Lake Tahoe Area



Source: BlueGo, www.bluego.org

Table 5.2: BlueGo Transit Service Schedules of Routes that Serve Douglas County and the Lake Tahoe Area

19x

NORTHBOUND 19X - WEEKDAY EXPRESS						
Tillman Center	Herbig Park/ Senior Center	CVI	Starbucks Roasting Plant	Romans Rd	Fuji Park	Washington/ Plaza
6:20	6:28	6:37	6:50	*	7:05	7:30
7:20	7:28	7:37	**	7:55	8:00	8:15
1:35	1:43	1:52	**	*	2:10	2:30
3:10	3:18	3:27	3:40	3:55	4:00	4:20
5:10	5:18	5:27	5:40	5:55	6:00	6:20

SOUTHBOUND 19X - WEEKDAY EXPRESS						
Washington/ Plaza	Fuji Park	Romans Rd	Starbucks Roasting Plant	CVI	Herbig Park/ Senior Center	Tillman Center
6:10	6:23	*	6:40	6:58	7:06	7:20
7:35	7:48	7:52	8:07	8:25	8:33	8:45
9:35	9:48	*	**	10:07	10:15	10:28
3:10	3:23	3:27	3:42	4:00	4:08***	4:20***
4:45	4:58	5:02	5:17	5:35	5:43***	5:55***

*No service to this destination.

**No service to this destination. This route will stay on US 395 and will not deviate from US 395.

***This bus will be identified as the Westbound 20x. This bus will complete the Southbound 19x route and then continue to Lake Tahoe as the Westbound 20x.

Note: AM Times are shown in lightface type, PM Times are shown in boldface type.

19x Route 19X operates Monday - Friday, but does not operate on weekends or the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas.

20x

WESTBOUND 20X - WEEKDAY EXPRESS									
Herbig Park/ Senior Center	Gillman/ US 395	Tillman Center	Foothill Park & Ride	Tramway/ Tina	The Ridge Resorts	Market Street (West)	Kingsbury Transit Center	Staterline Transit Center	
5:25	5:27	5:35	5:48	6:03	*	6:10	6:12	6:30	
6:20	6:22	6:30	6:43	6:58	*	7:05	7:07	7:25	
7:00	7:02	7:10	7:23	7:38	**	7:45	7:47	8:05	
4:08	4:10	4:20	4:33	4:48	**	4:55	4:57	5:05	
5:43	5:45	5:55	6:08	6:23	**	6:30	6:32	6:40	

EASTBOUND 20X - WEEKDAY EXPRESS									
Staterline Transit Center	Kingsbury Transit Center	Market Street (East)	Tramway/ Tina	The Ridge Resorts	Foothill Park & Ride	Tillman Center	Herbig Park/ Senior Center		
5:15	5:18	5:25	5:32	*	5:42	5:55	6:20		
8:35	8:38	8:45	8:52	*	9:02	9:15	9:40		
3:40	3:43	3:50	3:57	*	4:07	4:20	4:45		
4:10	4:13	4:16	4:23	4:35	4:55	5:10	5:20		
5:35	5:38	5:45	5:52	*	6:02	6:15	6:40		

WESTBOUND 20X - WEEKEND EXPRESS									
Herbig Park/ Senior Center	Gillman/ US 395	Tillman Center	Foothill Park & Ride	Tramway/ Tina	The Ridge Resorts	Market Street (West)	Kingsbury Transit Center	Staterline Transit Center	
5:25	5:27	5:35	5:48	6:03	*	6:10	6:12	6:25	
7:00	7:02	7:10	7:23	7:38	**	7:45	7:47	8:00	
2:35	2:37	2:45	2:58	3:13	**	3:20	3:22	3:35	
3:00	3:02	3:10	3:23	3:38	**	3:45	3:47	4:00	
5:15	5:17	5:25	5:38	5:53	**	6:00	6:02	6:15	

EASTBOUND 20X - WEEKEND EXPRESS									
Staterline Transit Center	Kingsbury Transit Center	Market Street (East)	Tramway/ Tina	The Ridge Resorts	Foothill Park & Ride	Tillman Center	Herbig Park/ Senior Center		
6:30	6:33	6:38	6:45	*	6:57	7:10	7:30		
8:00	8:03	8:08	8:15	*	8:27	8:40	9:00		
3:40	3:43	3:48	3:55	*	4:07	4:20	4:40		
4:10	4:13	4:18	4:25	4:33	4:55	5:08	5:20		
6:30	6:33	6:38	6:45	*	6:57	7:10	7:30		

*No service to this destination.

**There is no direct service to The Ridge Resorts on Westbound 20x. Passengers traveling to The Ridge Resorts will need to disembark at Tramway/Tina and transfer to the Eastbound 23. The only guaranteed connection time with the Eastbound 23 will be at 7:40 at Tramway/Tina. Otherwise, connection times with the Eastbound 23 are not guaranteed.

Note: AM Times are shown in lightface type, PM Times are shown in boldface type.

20x Route 20X operates on the weekend schedule during the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas.

21x

NORTHBOUND 21X - WEEKDAY EXPRESS						
Staterline Transit Center	Safeway Roundhill	Zephyr Cove	US 50 Park & Ride	Topsy Lane	Fuji Park	Washington/ Plaza
5:30	5:39	5:46	on request**	6:10	6:12	6:33
6:30	6:39	6:46	on request**	7:10	7:12	7:33
8:30	8:39	8:46	on request**	9:10	9:12	9:33
2:05	2:14	2:21	on request**	2:45	2:47	3:08
3:30	3:39	3:46	on request**	4:10	4:12	4:33
5:35	5:44	5:51	on request**	6:15	6:17	6:38

SOUTHBOUND 21X - WEEKDAY EXPRESS						
Washington/ Plaza	South Curry	Topsy Lane	US 50 Park & Ride	Zephyr Cove Resort	US 50/ Elks Point	Lakeside Casino
6:35	6:43	6:48	6:54	7:17	7:19	7:23
7:30	7:38	7:43	7:49	8:12	8:14	8:18
2:30	2:38	2:43	2:49	3:12	3:14	3:18
3:00	3:08	3:13	3:19	3:42	3:44	3:48
4:30	4:38	4:43	4:49	5:12	5:14	5:18
6:40	6:48	6:53	6:59	7:22	7:24	7:28

NORTHBOUND 21X - WEEKEND EXPRESS						
Staterline Transit Center	Safeway Roundhill	Zephyr Cove	US 50 Park & Ride	Topsy Lane	Fuji Park	South Curry
5:30	5:39	5:46	on request**	6:10	6:12	6:17
8:30	8:39	8:46	on request**	9:10	9:12	9:17
2:30	2:39	2:46	on request**	3:10	3:12	3:17
3:30	3:39	3:46	on request**	4:10	4:12	4:17
4:30	4:39	4:46	on request**	5:10	5:12	5:17

SOUTHBOUND 21X - WEEKEND EXPRESS						
Washington/ Plaza	South Curry	Fuji Park	US 50 Park & Ride	Zephyr Cove Resort	US 50 & Elks Point Road	Lakeside Casino
6:30	6:38	6:43	6:47	7:10	7:12	7:16
7:30	7:38	7:43	7:47	8:10	8:12	8:16
3:30	3:38	3:43	3:47	4:10	4:12	4:16
4:30	4:38	4:43	4:47	5:10	5:12	5:16
6:30	6:38	6:43	6:47	7:10	7:12	7:16

**No service to this destination; no hay service.

**Passengers must call the dispatcher at (530) 541-7149 at least one hour before the pick-up time to request a pick-up at this location.

Note: AM Times are shown in lightface type, PM Times are shown in boldface type.

21x Route 21X operates on the weekend schedule during the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas.

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5.1.4 CARSON VALLEY AIRPORTER

Shuttle service is available for Carson Valley to the Reno–Tahoe International Airport. Regularly scheduled round-trip service is provided between the airport and Gardnerville and Minden four times a day. The schedule is shown in Table 5.3.

Table 5.3: Carson Valley Airporter Schedule

		Departs:			Arrives:	
Reno National Bowling Center 4th & Lake St	Reno Airport	Carson City Transportation Center	Courtyard By Marriott Carson City	Holiday Inn Express 1659 Hwy 88 Minden	Carson Valley Inn Minden	Gardnerville Community Center
10:00 AM	10:30 AM	10:59 AM	11:14 AM	11:34 AM	11:47 AM	11:55 AM
12:15 PM	12:45 PM	1:14 PM	1:29 PM	1:49 PM	2:02 PM	2:10 PM
2:45 PM	3:15 PM	3:44 PM	3:59 PM	4:19 PM	4:32 PM	4:40 PM
7:15 PM	7:45 PM	8:14 PM	8:29 PM	8:49 PM	9:02 PM	9:10 PM
Departs:					Arrives:	
Gardnerville Community Center	Carson Valley Inn Minden	Holiday Inn Express 1659 Hwy 88 Minden	Courtyard By Marriott Carson City	Carson City Transportation Center	Reno Airport	Reno National Bowling Center 4th & Lake St
6:00 AM	6:10 AM	6:23 AM	6:43 AM	6:58 AM	7:27 AM	7:57 AM
8:00 AM	8:10 AM	8:23 AM	8:43 AM	8:58 AM	9:27 AM	9:57 AM
11:55 AM	12:05 PM	12:18 PM	12:38 PM	12:53 PM	1:22 PM	1:52 PM
4:30 PM	4:40 PM	4:53 PM	5:13 PM	5:28 PM	5:57 PM	6:27 PM

5.1.5 EASTERN SIERRA TRANSIT

Eastern Sierra Transit provides round trip transit along U.S. Highway 395 between Lone Pine and Reno on Mondays, Tuesdays, Thursdays and Saturdays. The service makes one round trip daily from Lone Pine, stopping at (among other locations) Smith's in Gardnerville (currently 10:45 a.m. northbound, 24-hour advance reservation required) and at the Carson Nugget in Carson City. On the southbound trip it stops at the AM/PM mini-market, 1338 U.S. Highway 395 on the corner of Waterloo Lane (2:30 p.m., 24-hour advance reservation required).

5.2 Evaluating Douglas County Transit Services

Public transit services should be evaluated regularly to determine if they are meeting locally established transportation objectives. One method for analyzing transit operations is to review certain quantifiable data, such as operating costs, passenger trips, fare revenue, vehicle revenue hours and miles traveled. Table 5.4 provides DART performance measures and performance indicators data for fiscal year 2014–2015.

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DART is a popular and efficient service, providing 33,755 passenger trips during fiscal year 2014–2015. These trips provided transportation to the elderly and persons with disabilities, as well as regular and deviated fixed route service. The low fare recovery ratio (2.3 percent) reflects the very low fare per passenger, which is related to the social service nature of the program.

**Table 5.4: DART Measures of Effectiveness—
FY 2014 to FY 2015**

DOUGLAS AREA RURAL TRANSIT	
Performance Measures	
Operating cost	\$493,378
Fare revenue	\$11,500
Vehicle revenue hours	13,800
Vehicle revenue miles	169,381
Total passenger trips	33,755
Performance Indicators	
Operating cost/hour	\$35.75
Operating cost per passenger trip	\$14.62
Passenger trips/hour	2.45
Passengers trips/mile	0.2
Fare recovery ratio	2.33%

Source: Douglas County Community Services Division

5.2.1 PERFORMANCE MEASURES

The following definitions of performance measures and performance indicators are consistent with the definitions provided in the Federal Transit Administration National Transit Database. See Table 5.4 for DART performance measures.

Operating Cost

The full cost of operating the transit system, excluding the following items: (a) costs of depreciation and amortization, (b) direct costs of providing charter service, (c) vehicle lease costs, and (d) premiums for liability and casualty insurance and payments of liability claims.

Fare Revenue

Revenue collected from fares plus ticket/pass sales.

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Vehicle Revenue Hour

The time during which a revenue vehicle is available to carry fare paying passengers, and which includes only those times between the time or scheduled time of the first passenger pickup and the time or scheduled time of the last passenger drop-off during a period of the vehicle's continuous availability.

Vehicle Revenue Mile

Those miles traveled by revenue vehicles during their vehicle revenue hours.

Total Passenger Trips

Total number of unlinked trips; all boardings, whether revenue producing or not.

5.2.2 PERFORMANCE INDICATORS

Each of these performance indicators is obtained by using simple computation of the performance measures above. See Table 5.4 for DART indicators of service effectiveness.

Operating Cost per Hour

Total operating costs for transit service divided by total hours of service provided.

Operating Cost per Passenger Trip

Total operating costs for transit service divided by total number of passenger trips provided.

Passenger Trips per Hour

Total number of passenger trips divided by total hours of vehicle revenue service provided.

Passenger Trips per Mile

Total number of passenger trips divided by total number of vehicle revenue miles.

Fare Recovery Ratio

Total fare revenues divided by total operating costs for transit service, expressed as a percentage.

5.3 Public Transportation Needs Assessment and Issues

Transit service routes are designed to connect riders with their points of origin and destination. As such, a number of key attractors should be considered when establishing transit routes. These include population centers, shopping centers, employment centers, travel hubs, education and recreation facilities.

As indicated earlier in this chapter, several entities currently provide transit services within and through Douglas County. These include DART, BlueGo, the Carson Valley Airpporter and Eastern Sierra Transit. In aggregate these operations serve most of the key attractors within the Carson Valley, including the Tillman Center, Douglas County Senior Center, Herbig Park,



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Carson Valley Medical Center, Carson Valley Inn, Smith's shopping center, Carson Valley Swim Center and Douglas County Library. They also serve the population centers of the Gardnerville Ranchos and the downtown Minden Gardnerville area, as well as the employment areas clustered along U.S. 395 through downtown, and the Stateline casino area. Furthermore, these services connect to Washoe RTC transit providing Douglas County residents with transportation to Reno and the Reno-Tahoe International Airport.

There are a few existing attractors in Douglas County where public transit service is lacking. These include Western Nevada College, the Minden/Tahoe Airport, the Johnson Lane area, the Target shopping center, and the Carson Valley Plaza (north Walmart shopping center). The transit providers should evaluate the potential ridership associated with these attractors and consider modifying their existing routes to serve these locations.

As Douglas County continues to focus growth in the Minden–Gardnerville area and along U.S. 395, residents expect and need a more active transit service in this corridor. The estimated increase in population to 70,376 by 2040 will likely require the development of more frequent fixed route and demand responsive service covering a wider geographical area. This expanded service will become especially important as Douglas County attracts a larger population of retired residents who require more public transportation services. Increased regular transit service will require expanded DART service to transport disabled and elderly riders to health care, personal business, and shopping trips. DART currently meets all the requirements of the Americans with Disabilities Act (ADA), by providing equal access to the Douglas County transit service for disabled riders.

Increased tourist and employment activity in the Lake Tahoe area will also require an increased role for public transportation in this region. More people will visit Douglas County looking for alternatives to driving alone in single-occupant vehicles. Expanded transit service will add to the attractiveness of this already popular tourist area, by making travel convenient and accessible.

Employment growth also signals the need for expanded public transit services. With new employment facilities concentrated around the Minden–Tahoe Airport, North County and downtown Gardnerville and Minden, there will be increased demand for services in these areas. Flexible fixed route, demand-responsive and vanpool services should be considered for these employment centers.

Transit service costs will continue to rise due to increased costs for fuel, liability insurance, maintenance and labor. Douglas County will need to carefully evaluate additional transit programs to determine which services are most cost-effective. By reviewing the performance measures and the performance indicators each year, local policy makers will have the information to make effective decisions about transit service levels.

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It would be appropriate for Douglas County to prepare a short range transit plan within the next three years to determine the logistics of implementing improved local transit services, including the following issues:

- Expand transit service hours, especially evenings and weekends.
- Expand transit service areas and routes to serve the key attractors where service is currently lacking.
- Connect rural communities in northern Nevada.
- Increase frequency for demand-responsive service in compliance with the Americans with Disabilities Act.
- Develop transit system goals and objectives.
- Develop a comprehensive transit financial plan.
- Preserve a transit corridor along the former Virginia & Truckee Railroad right-of-way.

5.4 Future Transportation Options

5.4.1 CARSON VALLEY/LAKE TAHOE GONDOLA

In considering potential future transportation options, Douglas County staff requested a brief analysis of a potential future gondola connection between the Carson Valley and the Lake Tahoe area. Representatives of the Heavenly Mountain Ski Resort, the Tahoe Regional Planning Agency (TRPA), the Tahoe Transportation District (TTD), and Douglas County staffs were contacted to determine if their plans contained any mention of this potential future service.

- **Mobility 2035, Lake Tahoe Regional Transportation Plan, 2012.** The plan contains no reference to a Lake Tahoe gondola/tram connection to the Carson Valley.
- **Heavenly Mountain Resort Master Plan, 2007.** The master plan identifies no plan for a future gondola connection to the Carson Valley. Heavenly Ski Resort is currently updating their master plan, which will contain no plan for a Carson Valley gondola/tram connection according to Resort staff.
- **Tahoe Transportation District documents provided on website.** None of the district documents contains any reference to a future gondola/tram connection with the Carson Valley.

A number of factors were considered in identifying potential sites for the Carson Valley terminus of the gondola, including parcel location relative to the ski resort, private versus public ownership, developed versus undeveloped condition, floodplain condition, and master plan land use and zoning.

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Many of the parcels in the area east of Foothill Road are in the floodplain and/or appear to exhibit wetlands conditions. Regarding land use and zoning, of the parcels in the project vicinity only the Walley and David's parcels currently have commercial zoning. All other parcels are zoned for either Forest and Range or Agriculture.

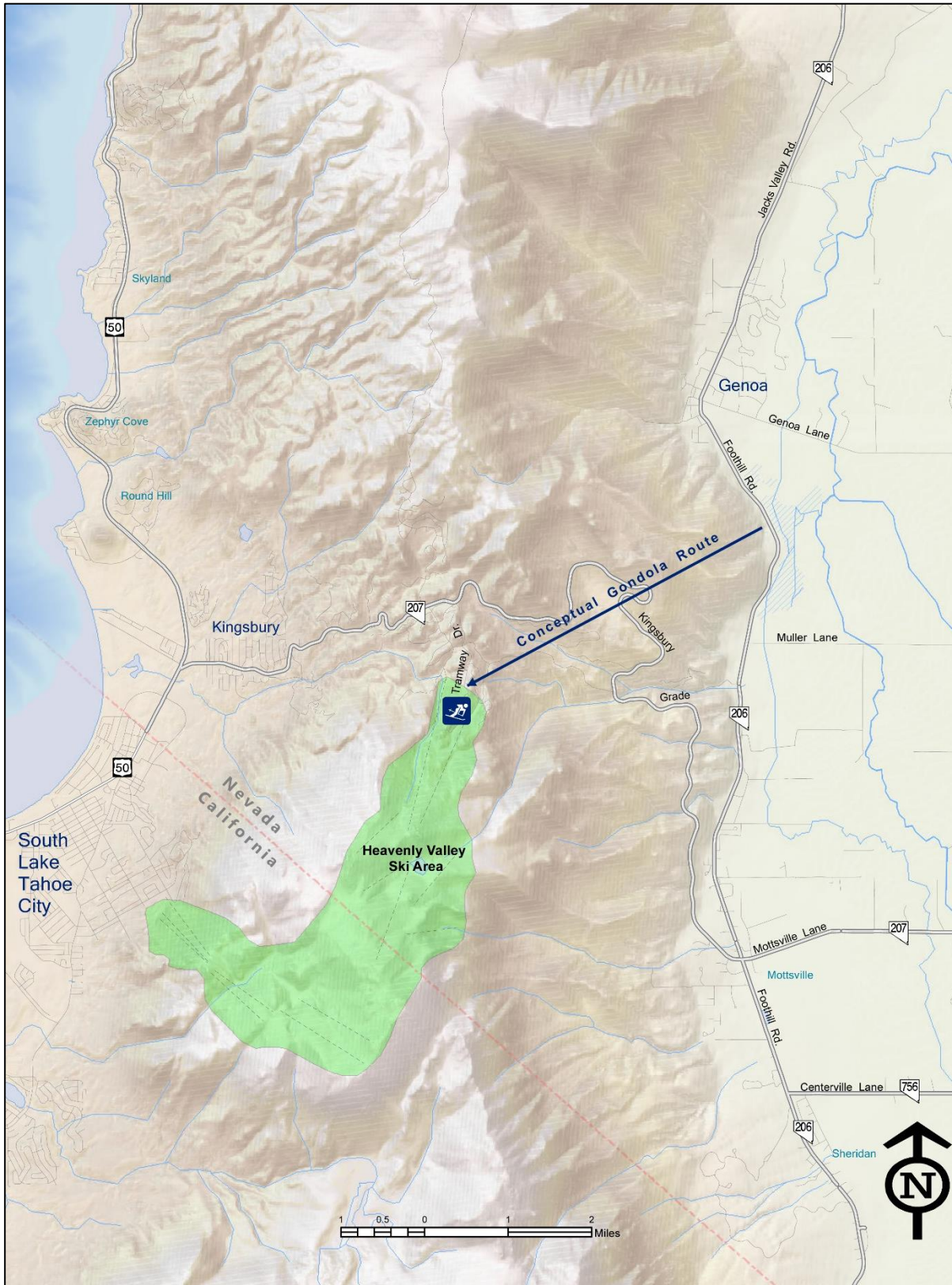
The distance traversed by the gondola as depicted is approximately three miles. The order-of-magnitude cost estimate for the gondola is \$30 million to \$35 million. The details are shown in Table 5.5.

Table 5.5: Carson Valley/Lake Tahoe Gondola Cost Estimate

CARSON VALLEY GONDOLA	COUNT	QUANTITY	UNIT OF MEASURE	COST (\$ million)
Parking lot parcel B		100	space	\$0.30
Cables	5	532	ton	\$10
Towers	5	550	ton	\$10 to \$15
Gondola cabins		28	ea	\$8
Stations with safety equipment		2	ea	\$2
Gondola Total				\$30 to \$35

Note: Cost estimate is based on unit costs from the Peak 2 Peak gondola in Whistler, BC, built in 2008

Figure 5.4: Potential Carson Valley/Lake Tahoe Gondola Route



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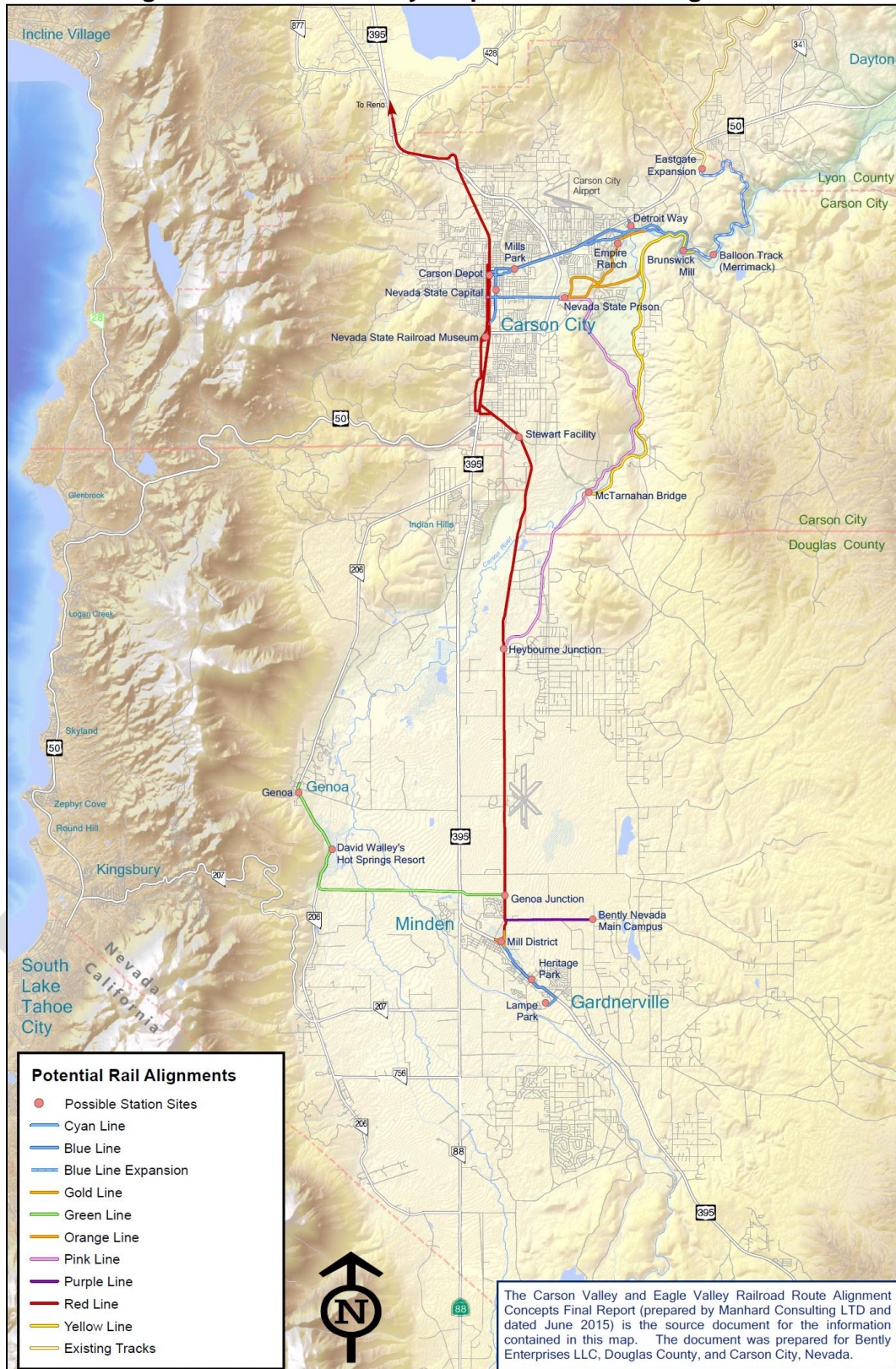
5.4.2 VIRGINIA AND TRUCKEE RAILROAD

The Virginia and Truckee (V&T) Railroad was originally incorporated in 1868, and by 1872 the railroad was in service from Virginia City to Carson City and on to Reno. In 1905, a new Virginia and Truckee Railway was incorporated to buy the assets of the V&T Railroad. This allowed the new V&T to build a 15-mile extension from Carson City south to Minden to serve the livestock and agricultural interests of the Carson Valley. The Dangbergs had considerable land holdings at the time and provided most of the right-of-way for the new extension. By 1906, the Carson City railroad shops had built an express and mail car for the new Minden Branch. Before there were paved roads, the V&T moved large numbers of cattle to the Carson Valley where they were fattened before being sent to slaughter. In the early 1920's, the State of Nevada constructed a paved highway (U.S. 395) from Reno to Minden, which started the decline of the V&T. In the 1940's, the V&T still had facilities for turning locomotives and entire trains in Minden, but by then the railroad was in serious financial trouble. The Minden Depot was featured briefly in the 1949 film *Chicken Every Sunday*, but the railroad's last revenue operating day was May 31, 1950. Removal and scrapping of the rails began almost immediately and was completed the same year. Large portions of the right-of-way were purchased by the state highway department, while other portions reverted to local ranchers.¹ Photocopies of the Virginia and Truckee Railway maps showing the railroad alignment from Minden to Carson City are provided in Appendix B.

The V&T resumed operation out of Virginia City in 1976, extending the track improvements as far as the Carson City border in 2009. It currently operates from May through October between Virginia City and Gold Hill. In recent years there has been interest in restoring operation of the V&T in the Carson Valley. In 2015, Manhard Consulting, LTD prepared the *Carson Valley/Eagle Valley Railroad Route Alignment Concepts Final Report* for Bently Enterprises, Douglas County and Carson City. This document provides potential rail alignments connecting Minden to Carson City, and also Genoa. Refer to Figure 5.5. Two alignments identified in the report provide options for light rail street cars in the Minden-Gardnerville area. The "Purple" line would connect to the main line at Heybourne Road and serve the Bently Campus area, while the "Cyan" line would serve the downtown area from Buckeye Road to Lampe Park. Key figures from the report that show potential future railway alignments in Douglas County are provided in Appendix B.

¹ Stephen E. Drew, *Nevada's Virginia & Truckee Railroad (Images of Rail)*, Charleston, South Carolina: Arcadia Publishing, 2014.

Figure 5.5: Carson Valley Proposed Railroad Alignments



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5.5 Public Transportation Policies

- 5.5.1 Provide general public transit service to Douglas County residents and visitors.
- 5.5.2 Provide transit services to the elderly and persons with disabilities, as required by the Americans with Disabilities Act.
- 5.5.3 Provide regional public transit, connecting Douglas County residents and visitors with Carson City, Washoe County and Alpine County (California).
- 5.5.4 Promote use of local and regional public transit serving Douglas County residents and visitors.
- 5.5.5 Develop public transit goals and objectives to measure the transit system performance.
- 5.5.6 Annually review performance measures and indicators for existing transit services and adjust services accordingly.
- 5.5.7 Prepare a short range transit plan by 2018, including a five-year transit project list, which identifies transit needs and potential service improvements along with a financial plan.
- 5.5.8 Establish and preserve a transportation corridor in the vicinity of the former Virginia & Truckee railroad right-of-way between Minden and the Carson City line, parallel to Heybourne Road.
- 5.5.9 Evaluate the feasibility of providing rubber-tire transit service to initially serve major travel destinations as development occurs along the Heybourne Road corridor. Identify potential private and public funding sources to establish and maintain service.

5.6 Public Transportation Financial Considerations

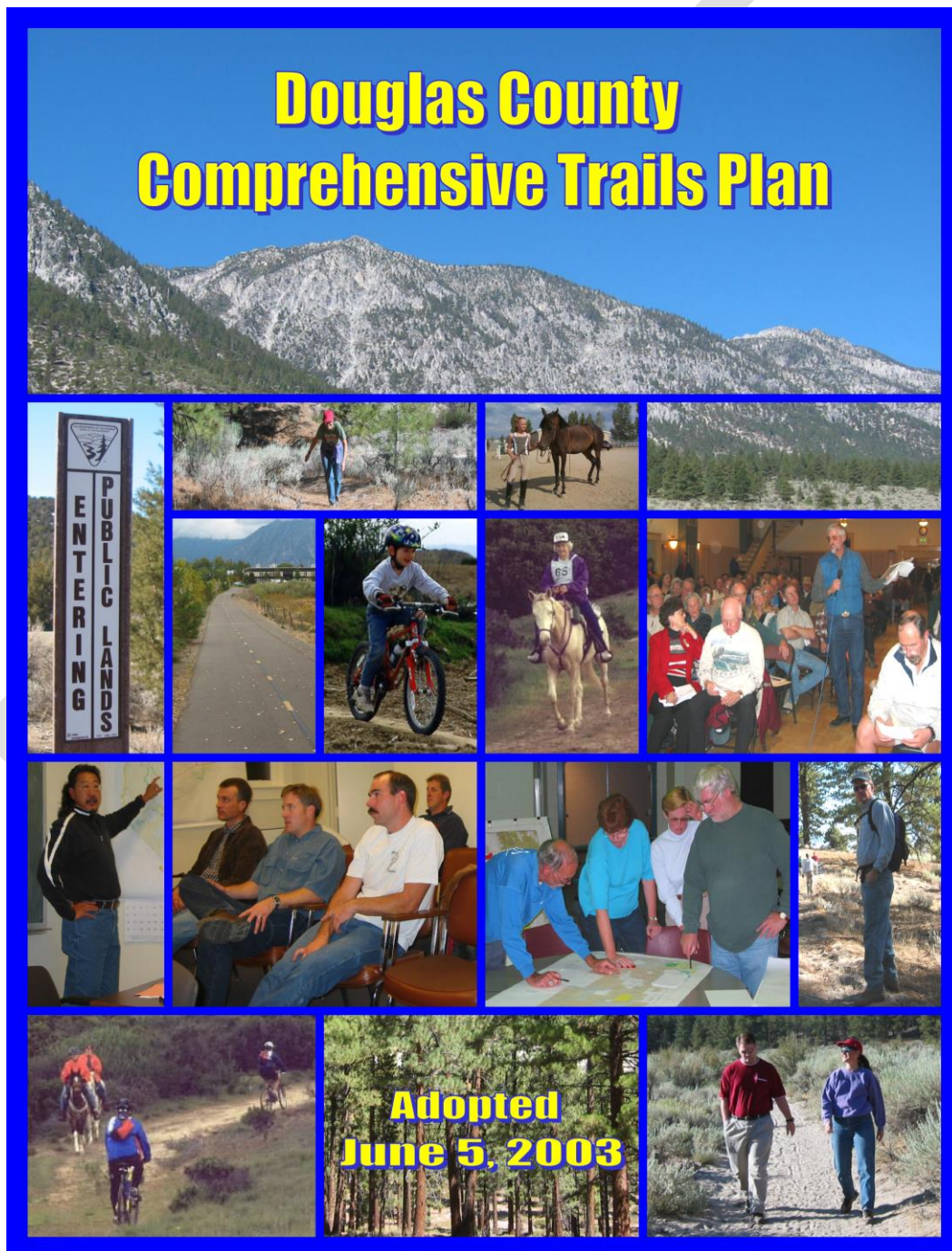
Douglas County operates the DART with funding from senior service agencies, transient occupancy tax collected outside the Lake Tahoe area, the Douglas County General Fund and various Federal Transit Administration grant programs.

The county will need to explore additional funding sources such as local sales tax, federal transit funds and partnerships with local businesses to expand services in the future. Development of a short range transit plan will aid this assessment by exploring transit services and funding options in more detail.

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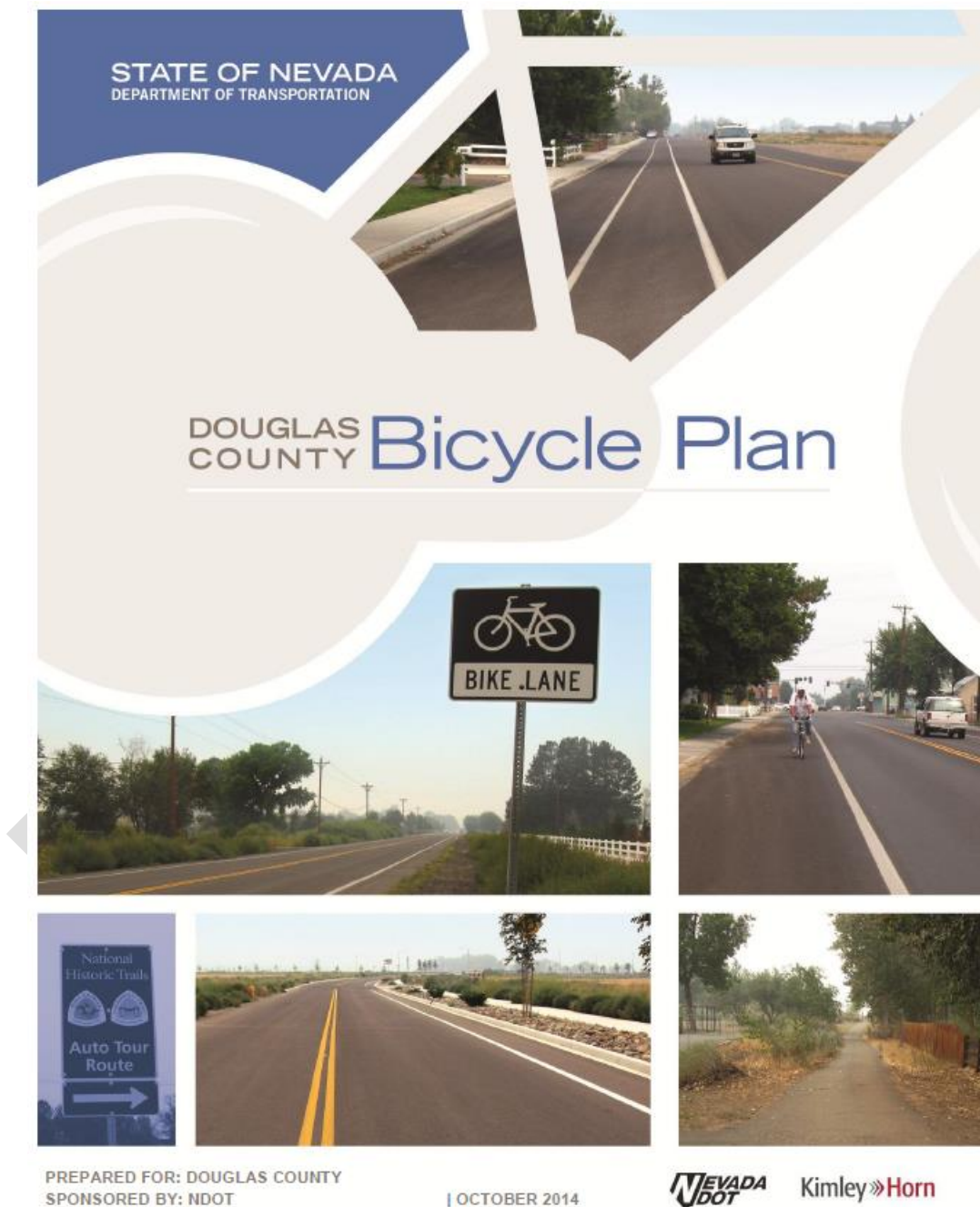
Chapter 6 BICYCLE/PEDESTRIAN/TRAILS ELEMENT

The *Douglas County Comprehensive Trails Plan* is a separate document identifying bicycle and pedestrian facilities, which is incorporated in its entirety into the *2016 Douglas County Transportation Plan*. The current version of this document is available on the Douglas County website.



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The *Douglas County Bicycle Plan* is a separate document identifying bicycle facilities, which is incorporated in its entirety into the *2016 Douglas County Transportation Plan*. This document supplements the bicycle information contained in the Douglas County Comprehensive Trails Plan. The current version of the *Douglas County Bicycle Plan* is available on the Douglas County website.



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6.1 Bicycle/Pedestrian/Trails Policies

- 6.1.1 Maintain and implement the adopted *Douglas County Comprehensive Trails Plan* to provide opportunity for non-motorized transportation within the county that meets both recreational and commuter needs.
- 6.1.2 Ensure development and maintenance of multi-purpose (hiking, equestrian, bikeway and off-road bicycle) trail systems throughout Douglas County, connecting with public lands and recreation facilities of local and regional interest.
- 6.1.3 Maintain and implement the *Douglas County Bicycle Plan*.

Chapter 7 AVIATION ELEMENT

The *Minden-Tahoe Airport Plan* is a separate document, which is incorporated by reference in its entirety into the *2016 Douglas County Transportation Plan*. The current version of this document is available on the Douglas County website.



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7.1 Aviation Policies

7.1.1 Provide for safe continuation and expansion of the Minden–Tahoe Airport.

7.2 Aviation Goals

The following are goals identified in the Minden-Tahoe Airport Master Plan (AP).

- AP Goal 1: Accommodate forecast operations in a safe and efficient manner.
- AP Goal 2: Ensure that future development will continue to accommodate a variety of general aviation activities.
- AP Goal 3: Enhance and facilitate soaring while maintaining and improving safety.
- AP Goal 4: Identify the best land use types for the landside development areas.
- AP Goal 5: Foster complementary development of Airport’s environs.
- AP Goal 6: Enhance the self-sustaining capability of the Airport and ensure the financial feasibility of airport development.
- AP Goal 7: Encourage the protection of existing public and private investment in land and facilities.

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Chapter 8 FINANCIAL ELEMENT

8.1 Funding for Road Maintenance

There has been a shortfall in funding for road maintenance in Douglas County for many years. In recent years the county has taken the following steps toward increasing funding:

- In 2004, a ballot initiative to implement a \$0.05 gas tax failed.
- In 2011, the Board of Commissioners approved shifting \$191,000 annually in property tax revenue from the General Fund to the Road Operating Fund.
- In 2012, the Board of Commissioners approved a goal to shift \$140,000 per year in property tax revenue from the General Fund for five years, for a total of \$700,000 annually by fiscal year 2016/2017.
- In 2013, the Board of Commissioners used priority based budgeting to shift more than \$1,000,000 per year in property tax revenue from the General Fund to the Regional Transportation Fund for preventive maintenance.
- In 2013, the Board of Commissioners directed the county manager to create a Road Funding Task Force to identify solutions to road maintenance funding challenges.

In the fall of 2013, the county manager created a task force composed of 18 members of the public who were active in the community. Public Works Department staff provided technical assistance to the task force. The task force met on a monthly basis and made several presentations to the Board of Commissioners. Their final presentation to the board was on March 6, 2014. Potential funding options identified included:

- General Fund shift of existing county-wide property taxes
 - Board discretion/budget process
- Create new road general improvement districts (GID) to fund county local roads
 - NRS 318.0953
 - Would generate new property tax revenue from areas not currently in town or GID boundaries
- Utility operator fee
 - NRS 354.59881
 - 1 percent = \$800,000 per year
 - 2.5 percent available (1 percent every other year)
- Gas tax
 - NRS 373.030
 - \$0.05 per gallon = \$900,000 per year
 - May be phased in over time

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- Infrastructure tax
 - NRS 377B.100
 - 1 percent = \$800,000 per year
 - 0.25 percent sales tax = \$1,500,000
- Public transit and road maintenance tax
 - NRS 377A.030
 - 0.50 percent sales tax = \$3,000,000 per year
 - Requires voter approval

At the meeting on March 6, 2014, the Board:

- Established a policy designating county-wide taxes to be used for regional/county roads and local taxes to be used for local/neighborhood roads.
- Directed staff to identify additional funding to be shifted to road maintenance for collector roads as part of the fiscal year 2014/2015 budget process.

On December 3, 2015, the Board of Commissioners approved Ordinance No. 2015-1446, increasing its county option motor vehicle fuel tax from \$0.04 to \$0.09 per gallon on gasoline and gasohol (NRS 373.030). On that date, the Board also approved Ordinance 2015-1445, which imposed an additional \$0.25 sales tax with an effective date of April 1, 2016. It is expected to generate \$1,500,000 annually for infrastructure use, including a portion for road maintenance and road construction projects.

8.2 Financial Policies

- 8.2.1 Coordinate with the NDOT to implement capital and operational improvements on state facilities in a timely manner.
- 8.2.2 Develop funding mechanisms to implement system-wide capacity and operational system improvements to the street and highway network.
- 8.2.3 Develop funding mechanisms to maintain the existing street and highway network.
- 8.2.4 Develop funding mechanisms to implement public transportation system improvements.
- 8.2.5 Develop funding mechanisms to implement improvements to the bicycle/pedestrian/trails system.
- 8.2.6 Develop funding mechanisms to implement improvements at the Minden–Tahoe Airport.
- 8.2.7 Explore the development and implementation of a traffic impact fee program to fund regional capacity improvements on the street and highway network.

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- 8.2.8 Develop and maintain a coordinated transportation plan of proposed transportation facility improvements in collaboration with adjacent jurisdictions.
- 8.2.9 Construct and maintain necessary street and road facilities in rural and urban settings to maintain a high quality-of-life in Douglas County

8.3 Funding for Proposed Transportation Projects

The total cost for projects needed to maintain the current LOS standards on Douglas County and NDOT roads through 2040 is estimated at \$741,800,000 (refer to tables 4.9 and 4.10). The Plan does not assign responsibility for these costs to any particular entity. Funding will need to be established for each project on a case-by-case basis. It is likely that each project will have funding from multiple sources. Based on past experience, potential funding sources include NDOT, Douglas County, and developer contributions. Developer contributions could include construction of improvements and/or monetary contributions.

In addition to the projects needed to maintain LOS standards, the Plan also identifies projects that provide alternate local and regional access. These projects are estimated to cost \$814,500,000.

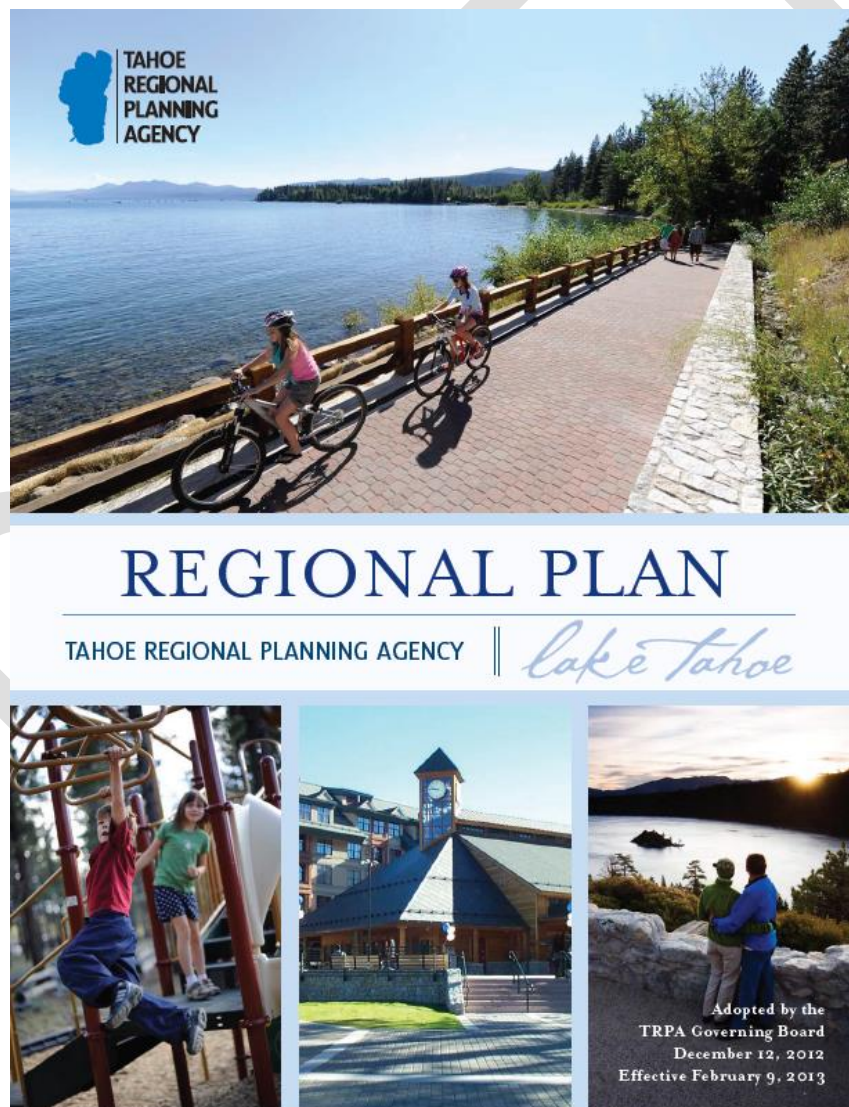
It is clear that the amount of funding required to implement the Plan is huge, and the County would need to contribute substantially to many of the projects. The County has not identified funding for construction of any of the capacity projects or alternate access projects identified in the Plan. This can be confirmed by a review of the current 5-Year Transportation Plan. To implement this Plan, the County must establish funding for the projects. Discussion of potential funding sources is beyond the scope of this document.

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Chapter 9 LAKE TAHOE ELEMENT

Transportation planning in the Lake Tahoe basin involves many organizations, including the Tahoe Regional Planning Agency (TRPA)/Tahoe Metropolitan Planning Organization (TMPO), Tahoe Transportation District (TTD), Tahoe Douglas Transportation District (TDTD), and the South Shore Transportation Management Association.

The *Lake Tahoe Regional Plan* was prepared by the Tahoe Regional Planning Agency and approved in February 2013. It is a separate document that addresses transportation planning in the Lake Tahoe basin. The Regional Plan is incorporated by reference in its entirety into the *2016 Douglas County Transportation Plan*. The current version of the Regional Plan is available on the Tahoe Regional Planning Agency website.



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9.1 Lake Tahoe Transportation Policies

LT T Policy 1: Participate and support the planning, design and implementation of transportation projects and transit improvements at Lake Tahoe consistent with the Tahoe Revitalization initiative of the County Economic Vitality Plan and other needs identified through the annual update of the County 5-Year Transportation Plan, County Transportation Plan, and plans of the TRPA, TMPO and TTD.

9.2 Lake Tahoe Transportation Actions

LT T Action 1.1: Douglas County shall participate with the TTD, TMPO, NDOT, City of South Lake Tahoe, Caltrans, FHWA, Nevada State Parks, and private sector stakeholders in the planning, design and implementation of the U.S. 50 Stateline Corridor/South Shore Revitalization Program.

LT T Action 1.2: Douglas County shall continue to participate in efforts to complete the Nevada Stateline-to-Stateline Bikeway Project and other identified bicycle and multi-use trail projects within Douglas County at Lake Tahoe consistent with the Tahoe Revitalization and Tremendous Trails initiatives of the County Economic Vitality Plan.

LT T Action 1.3: Douglas County shall continue to participate in the planning and implementation of transit system improvements through its representation on the Tahoe Transportation District Board of Directors.

LT T Action 1.4: Through the Tahoe Transportation District, Douglas County shall continue to explore the feasibility and potential benefits of waterborne transit at Lake Tahoe that serves the County and further supports the Tahoe Revitalization and the South Shore Plan.

LT T Action 1.5: Douglas County shall continue to participate in the community based forum of the South Shore Transportation Management Association (SS/TMA). SS/TMA plays a lead role in the development of transportation demand management and strategies to mitigate the impact of highway construction projects and special events.



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